

ANNUAL REPORT  
OF THE  
SURGEON GENERAL OF THE  
PUBLIC HEALTH SERVICE  
OF THE UNITED STATES

FOR THE FISCAL YEAR

1926



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1926

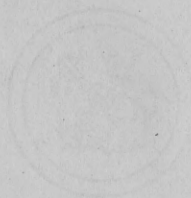


ANNUAL REPORT  
of the  
SURGEON GENERAL OF THE  
PUBLIC HEALTH SERVICE  
OF THE UNITED STATES

TREASURY DEPARTMENT

Document No. 2976

*Public Health Service*



## LETTER OF TRANSMITTAL

---

TREASURY DEPARTMENT,  
OFFICE OF THE SECRETARY,  
*Washington, December 6, 1926.*

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1926.

Respectfully,

A. W. MELLON,  
*Secretary of the Treasury.*

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

LETTERS OF TRANSMITTAL

The Board of Health of the State of New York, in accordance with section 2 of the law of 1900, approved July 1, 1901, has the honor to acknowledge the receipt of the report of the Surgeon-General of the State of New York for the fiscal year 1900.

Very respectfully,  
A. W. MASON,  
Secretary of the Board.  
The Secretary of the Board of Health,  
in

# CONTENTS

Foreword .....	Page 1
Division of Scientific Research .....	14
Cancer .....	14
Clonorchiasis .....	16
Goiter .....	17
Influenza .....	19
Leprosy investigation station .....	23
Malaria .....	27
Nutritional diseases .....	32
Rocky Mountain spotted fever .....	33
Administrative health practice .....	36
Child hygiene .....	37
Industrial hygiene and sanitation .....	42
Mental health .....	49
Milk .....	50
Statistical office .....	51
Stream pollution .....	56
Hygienic Laboratory .....	60
Viruses, serums, toxins, and analogous products .....	69
Cooperation with State and local boards of health .....	69
Miscellaneous .....	69
Division of Domestic (interstate) Quarantine .....	70
Plague-suppressive measures—	
Los Angeles .....	70
Oakland .....	86
Cities and counties on San Francisco Bay .....	87
New Orleans .....	91
Seattle .....	100
Trachoma eradication .....	101
Supervision of water supplies used by common carriers .....	104
Interstate sanitary districts .....	107
Sanitation in national parks .....	122
Sanitary inspections of shellfish areas .....	126
Rural sanitation .....	128
Mosquito control on Texas-Mexican border .....	129
Advisory committee on the education of sanitarians .....	131
Supervision of interstate travel of diseased persons .....	132
Conference of the Surgeon General with State and Territorial health officers .....	132
Division of Foreign and Insular Quarantine and Immigration:	
Quarantine transactions .....	133
General prevalence of quarantinable diseases .....	133
Changes in quarantine procedure .....	134
New quarantine station at Mobile, Ala. ....	134
Acquisition of the Texas quarantine system .....	135
International relations .....	136
Violation of quarantine laws .....	136
Summary of transactions at national (continental and insular) quarantine stations .....	137
Transactions at continental quarantine stations .....	137
Reports from continental quarantine stations .....	138
Texas border stations .....	153
Transactions at insular quarantine stations .....	154
Reports from insular quarantine stations .....	154
Transactions at foreign ports .....	163

Division of Foreign and Insular Quarantine and Immigration—Contd.	Page
Reports from foreign ports	164
Summary of quarantine transactions	169
Medical inspection of aliens	169
Examination of prospective immigrants abroad	170
Reports from immigration stations	179
Division of Sanitary Reports and Statistics	195
Morbidity reports	195
Collaborating and assistant collaborating epidemiologists	195
Telegraphic morbidity reports	196
Monthly State reports	197
Annual State morbidity reports	197
City reports	197
Mentally diseased, feeble-minded, and epileptic	197
Foreign reports	198
Prevalence of disease	199
Diseases in foreign countries during 1925	201
Sanitary legislation and decisions	203
Publications issued by the division	204
Section of public health education	204
Health information by radio	205
List of publications	205
Division of Marine Hospitals and Relief	209
Economies	209
United States Coast Guard	210
United States Employees' Compensation Commission	213
Lighthouse Service	214
Foreign seamen	215
International conference on the health of merchant seamen	215
Clinical work	215
Dental unit	218
Contract physicians	218
Costs of out-patient relief	219
Physical examinations	219
Radio medical advice to ships at sea	222
Clinical information	222
Disposition of surplus property	222
Construction and repair	224
Abstracts of field reports	225
Division of Venereal Diseases	258
Cooperative work with State health departments	258
Clinical studies and investigations	260
Social studies and investigations	261
Publications	262
Educational work with newspapers and journals	262
Work with the colored population	263
Pamphlets, film showing, lectures, exhibits	263
Reporting of venereal diseases	264
Clinics	265
Correctional and penal institutions	267
State laws and regulations:	
State legislation	267
Court decisions	268
Tabular summary	268
Division of Personnel and Accounts	282
Public-health districts	285
Commissioned medical officers	289
Reserve officers	290
Attending specialists	290
Acting assistant surgeons	290
Internes	290
Contract dental surgeons	291
Epidemiologists	291
Hygienic Laboratory	291
Pharmacists and administrative assistants	291
Boards	291



# CONTENTS

VII

Division of Personnel and Accounts—Continued.	Page
Accounts section.....	292
Financial statement.....	293
Chief clerk's office:	
Force on duty in the bureau.....	299
Printing and binding.....	299
Public Health Service library.....	299
Improvements and economies.....	299
Buildings and office quarters.....	300
Nursing, dietetic, and reconstruction section.....	301
Recommendations.....	303
Appendix.....	305

1	.....
2	.....
3	.....
4	.....
5	.....
6	.....
7	.....
8	.....
9	.....
10	.....
11	.....
12	.....
13	.....
14	.....
15	.....
16	.....
17	.....
18	.....
19	.....
20	.....
21	.....
22	.....
23	.....
24	.....
25	.....
26	.....
27	.....
28	.....
29	.....
30	.....
31	.....
32	.....
33	.....
34	.....
35	.....
36	.....
37	.....
38	.....
39	.....
40	.....
41	.....
42	.....
43	.....
44	.....
45	.....
46	.....
47	.....
48	.....
49	.....
50	.....
51	.....
52	.....
53	.....
54	.....
55	.....
56	.....
57	.....
58	.....
59	.....
60	.....
61	.....
62	.....
63	.....
64	.....
65	.....
66	.....
67	.....
68	.....
69	.....
70	.....
71	.....
72	.....
73	.....
74	.....
75	.....
76	.....
77	.....
78	.....
79	.....
80	.....
81	.....
82	.....
83	.....
84	.....
85	.....
86	.....
87	.....
88	.....
89	.....
90	.....
91	.....
92	.....
93	.....
94	.....
95	.....
96	.....
97	.....
98	.....
99	.....
100	.....

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

---

TREASURY DEPARTMENT,  
BUREAU OF THE PUBLIC HEALTH SERVICE,  
*Washington, October 15, 1926.*

SIR: In accordance with the act approved July 1, 1902, I have the honor to submit, for transmission to Congress, the following report of the operations of the United States Public Health Service for the fiscal year ended June 30, 1926. This is the fifty-fifth annual report of this service, covering the one hundred and twenty-eighth year of its existence.

The functions of the Public Health Service as at present organized include (1) the investigation of the diseases of man and the discovery of practical and economical methods for their control; (2) the prevention of the interstate spread of disease and the suppression of epidemics, this latter function being exercised as a rule in cooperation with State and local authorities; (3) the prevention of the introduction of disease and of the immigration of diseased or disabled individuals from foreign countries into the United States; (4) the collection, publication, and distribution of reports of cases and deaths from communicable diseases from ports and places in the United States and from foreign countries with which we have commercial relations, practically from all over the world; (5) the furnishing of medical and hospital relief to merchant seamen (including foreign seamen), to civil employees sick or injured in line of duty, to officers and enlisted men of the Coast Guard Service, patients of the Veterans' Bureau, and to numerous other beneficiaries; (6) the making and recording of physical examinations of applicants for civil service positions, applicants for positions and promotions in the Coast Guard Service, applicants for pensions, and of such examinations for many other purposes; (7) the prevention and control of venereal diseases; (8) the supervision, regulation, and control of the importation and of the sale in interstate commerce of biologic products; (9) public health education and dissemination of health information; and (10) cooperation with international health organizations, with the national health services of foreign countries, with other departments and bureaus of the Government of the United States, with State and local agencies, with volunteer social and civic organizations, and with organized industry in the study and control of contagious and other diseases and in the application of general and specific principles in the prevention of disease and the general improvement of sanitary conditions.

It should be borne in mind that an increase in the facilities for the transportation of human beings and of commodities multiplies opportunities for the introduction of communicable diseases from one State or community into another, and from foreign countries into the United States; that increases in population produce marked tendencies to more than corresponding increases in sickness and death; and that such increases will surely follow unless the means of preventing them are placed at the disposal of our public health agencies, and unless the people themselves will cooperate with their health authorities. Outstanding examples of the results of lowered standards of health administration are perhaps not out of place in this report. I refer (1) to the undue prevalence of smallpox in the United States resulting in quarantine by a foreign government against the State of Florida, and to interstate quarantine directed against persons from the entire United States who were proceeding to the Territories of Hawaii and Alaska, and to the actual suffering and deaths from this disease which occurred in a number of States and cities. All of these inconveniences, and particularly the deaths, could and ought to have been prevented. (2) The undue prevalence of typhoid fever as compared with immediately preceding years. This disease has heretofore been steadily declining since 1900. This decline has not been due to chance, but to intelligent effort; and it is unfortunate that the tendency to a relaxation of effort noted in previous annual reports actually resulted in an increase in the incidence of this disease as forecast. (3) Diphtheria, though steadily declining in recent years, is still far too prevalent. The protection of all children by the administration of toxin-antitoxin would soon result in the extermination of this disease; but if parents will not cooperate in the protection of their children, our health authorities are powerless to give them the benefit of this protection.

#### INVESTIGATION OF DISEASE

While the investigative work of the service, directed toward the elucidation of the causes and indicating methods of control of the diseases of man, has been continued under the same major topics as those of last year's report, there has been in every case a progress from one phase of the problem to another.

Particular interest attaches to the studies of child health which have followed the same group of children through several consecutive years, making possible an estimate of the effects produced by such factors as underweight, visual, dental, tonsillar, and other physical defects upon the health, progress, and welfare of the children, and also showing the effect, in later years, of the correction of these defects. This unique study is now beginning to bear fruit, as the analysis of various groups of data and their preparation for publication progresses. As a check upon its studies on white children the service has undertaken observations on colored children, who present, on account of their numbers, in portions of the country an important but hitherto unmeasured complication of the health problem.

Further studies of narcotic addiction, both clinical and laboratory, have tended only to support the former contentions of this service



that this evil is essentially a part of the larger problem of subnormality, a symptom in fact chiefly exhibited by individuals belonging to that minor but considerable portion of the population which is constitutionally below par mentally and ethically. Under the restrictive measures enforced even imperfectly by law, the evil of addiction appears decidedly to be diminishing, while the more inclusive problem of subnormality still awaits satisfactory solution.

The regulation of interstate traffic in biologic products, while a routine and continued activity, has not been without features of public interest. Largely during the past year it has been possible to standardize products used in the prophylaxis and treatment of scarlet fever to an extent warranting their application through commercial manufacture. The earlier results indicate a decided benefit from the use of the antitoxic serum in treatment but a more limited usefulness for the immunizing injections.

The experiments in nutritional diseases have made definite progress in further narrowing down the class of substances whose deficiency in the diet is responsible for pellagra, have elucidated a puzzling food factor by showing it to be of double composition, and have paved the way for more rapid and satisfactory experimentation by showing the susceptibility of the white rat to a condition closely simulating if not identical with pellagra.

Considerable progress has been made in the studies of the various aspects of industrial hygiene and sanitation. The problem of the dangers to health possibly inherent in the use of tetraethyl lead gasoline has received during the year virtual solution. By an intensive devotion of personnel to various phases of the problem, sufficient dependable data were secured to indicate that, under certain practicable conditions of production, handling, and use, this substance would not present any considerable health hazard. Practical suggestions for these processes have been drawn up, submitted to health organizations as a basis for regulation, and adopted in good faith by the manufacturing and handling interests. The working out of these suggestions is being observed thus far with satisfaction. Several other subjects of interest in industrial hygiene have been studied and a number of publications issued.

The menace of the disease known as Rocky Mountain spotted fever has been emphasized during the past year by its apparent spread to areas hitherto unattacked, by an increased case mortality rate in other areas, and by the fact that tourist travel in infected zones is apparently increasing. The control of this disease by direct action either against the ticks which transmit it or the wild animals which are intermediate hosts, seems an almost hopeless proposition on account of the vast and inaccessible breeding places of these species. It is particularly gratifying to report, therefore, the strong hopes entertained by the service of having developed a means of immunizing persons against this disease by prophylactic injections. The initial experiment of the foregoing year was repeated on a much larger scale this season with encouraging results, since there failed to develop a single case of fever in the inoculated groups, although exposure must have occurred, while a number of cases appeared among the uninoculated similarly exposed. If future experience confirms these hopeful results, it may be possible to eradicate the disease by reclaiming the infected areas by an artificially immunized population.



A new departure on the part of the service in investigating malaria control was signalized by the employment of airplanes for the distribution of arsenical dusts for the destruction of mosquitoes. These experiments give promise of success in adapted areas, and data are being collected as to precise methods and the estimation of costs.

The field studies of goiter, a disease distressingly prevalent in some parts of the country, have been continued, with the result of stimulating the interest of health officials, furnishing them with precise methods of survey and making available the best information of the time regarding control.

The milk investigations have been vigorously prosecuted, and a widespread interest and renewed activity in the practical sanitation of milk supplies have resulted. One hundred cities have adopted the tentative standard milk ordinance developed by this service as a result of these studies, and at the annual conference of State and Territorial health officers with the Surgeon General this ordinance was indorsed for adoption by all the States represented as embodying a uniform procedure to be recommended to communities. In actual operation this ordinance has been observed to be adopted with little opposition, to be capable of enforcement, and to result in measurable improvement in the sanitary quality and at the same time in increased consumption of milk. These studies have now been extended to the investigation of the mechanical features of proper pasteurization.

Studies in stream pollution, in addition to increasing our knowledge of natural and artificial purification, have succeeded during the year in laying the basis for impartial settlement of an interstate situation before it assumed the nature of controversy, and another similar investigation is now in progress.

#### PREVENTION OF THE INTERSTATE SPREAD OF DISEASE: RURAL SANITATION

Campaigns for the eradication of bubonic plague in rodents were successfully completed at New Orleans, La., and at Oakland, Calif., as was the campaign against human and rodent plague at Los Angeles, Calif. Measures for the routine trapping and examination of rodents are either in force or in process of organization in these cities as permanent activities of the local health departments and should furnish a reliable index both as to the degree of infestation and as to the character of any infection that might be found among the rats.

The only plague which now exists on the North American Continent is that among the ground squirrels of California. This infestation is widespread and may be expected to give rise to outbreaks of human and rodent plague from time to time in the cities and towns in this territory unless far more extensive operations than those hitherto in force are undertaken.

The cooperative rural health work continues to be one of our most important and productive activities. The fact that 84 per cent of our rural population is as yet unprovided with adequate official local health service—the lack of which causes loss of human life and earnings estimated at approximately \$1,000,000,000 each year—is sufficient evidence of the need of participation of the Public Health Service in the development of local health work.

Measures for safeguarding shellfish from pollution and contamination as conducted in cooperation with the Bureau of Chemistry and the Bureau of Fisheries, have resulted in great improvements in the methods used by the producing States, and in renewed confidence in the safety of shellfish on the part of the consuming States. Reasonably uniform rules, regulations, and methods of enforcement are being developed which will result in better observance as well as in better enforcement.

It is gratifying to note that measures for insuring safe drinking water supplies on interstate carriers, both trains and vessels, are meeting with better results each year, due to the increasing appreciation of the value of this work on the part of the companies concerned. The railroads have now practically completed the installation of the new type of water coolers for passenger cars wherein there is complete separation of the ice and drinking water.

Assistance has been rendered the National Park Service in the designing and installation of sanitary equipment in the national parks and in maintaining proper sanitary conditions in the numerous camps, hotels, dining rooms, and kitchens. The vast and increasing number of sight-seers and tourists who come to the national parks from every part of the United States and journey thence to many other parts makes sanitation imperative as a measure for the prevention of the interstate spread of disease.

#### FOREIGN QUARANTINE AND IMMIGRATION

There has been no importation of plague, cholera, yellow fever, or other major quarantinable disease during the year. This freedom from such importation has been accomplished with a minimum delay and expense to shipping and the traveling public, although the health conditions throughout the world show a slightly more threatening condition than at the time of my previous report.

In this connection it should be noted that the reported incidence of cholera increased considerably. There have been no marked diminutions nor recessions in the plague situation throughout the world, although it is believed that this disease has been eradicated from New Orleans, La., and Oakland, Calif.

Smallpox is present, to a less extent, practically everywhere, the disease having had a wide prevalence in the United States, especially in Florida and California.

Typhus fever, which has in previous years rapidly receded, stimulated, no doubt, by the strict bodily cleanliness required for those entering the United States, has during the past year practically remained stationary.

Recognizing that the prevention of the importation of epidemic diseases is based upon epidemiology, which must be constantly advancing, action has been taken to improve quarantine methods, making them more efficient, more precise, and less burdensome to commerce.

Changes in quarantine methods were recognized in the international conference held in Paris, in which the Public Health Service took an active part, resulting in the adoption of a treaty which will insure more scientific and efficient treatment of quarantine problems. An amendment to the quarantine regulations which will allow, in

certain instances, fumigation to be based upon actual conditions of the vessel and less upon routine procedure was authorized. Certain decisions were made, notably regarding the disinfection of rags, that testify to the rapid advance of maritime quarantine as a scientific procedure.

The inspection at European ports of emigrants intending to come to the United States, which was begun during the year, is apparently an unqualified success. It has, however, been a severe drain upon the medical personnel of the service, both on account of the number of officers needed and the special training required. The advantages and disadvantages of making examinations of emigrants previous to their definitely leaving their homes have been discussed for years. It is therefore believed that the report, given later, covering this work will be of considerable interest.

#### MORBIDITY REPORTS: PREVALENCE OF DISEASE

Changes are taking place which render the work of health officers more difficult and at the same time more important than it was a few years ago. The tendency to concentrate in the larger centers of population facilitates the spread of diseases dangerous to the public health, and makes necessary rigid supervision over water and milk supplies and the disposal of wastes.

Improvement in the means of transportation by sea, land, and air have had the effect of bringing closer together communities which have been considered as widely separated. In our own country hundreds of thousands of persons travel by automobile from State to State, especially during the vacation time. This and other modes of intercommunication make the presence of communicable diseases in any State of interest to every other State.

An earthquake in Japan arouses our sympathy, but it does not endanger our safety; but smallpox in England, cholera in Siam, plague in Egypt, or trachoma in Russia may be conveyed to our shores and introduced among our people in a very short time. A widespread epidemic of diphtheria in Canada will probably cause cases of this disease in the United States. In spite of all practicable precautions, typhus fever cases from Mexico are occasionally found in the Southwest.

The responsibilities of health officers—Federal, State, and local—are increasing, but our knowledge of disease is also increasing. We now know the methods by which many of the more important communicable diseases are transmitted, and this knowledge enables the health officer to take action to prevent the introduction or spread of these diseases. Some diseases—smallpox and diphtheria, for instance—could be practically eliminated if the public could be made to realize the advantages of using well known methods of prevention. Thousands of persons in the United States suffer and die each year because of lack of available information or indifference which prevents the use of methods of prevention, the efficacy and safety of which have been proved. Even when the results are reckoned only in dollars, intelligent, properly directed health work pays large dividends to the community.

Comparable statistics of deaths in the United States are available since 1900, when regular publication of returns from the registration area was begun by the Bureau of the Census.

The death rate in the registration area decreased from 17.5 per 1,000 population in 1900 to 11.6 in 1921, which was the lowest year for which complete returns have been received. In 1918, the year of the influenza epidemic, it rose to 18.1 per 1,000, but in general the decrease has been gradual and fairly steady. In 1922, the rate was 11.8 per 1,000; in 1923 it was 12.3; and in 1924, 11.9.

Incomplete returns show very little difference in the general death rates for the years 1924 and 1925. In the combined populations of 30 States the death rate was 11.7 per 1,000 population in 1925.

Thirty States reported 1,727,467 births for the calendar year 1925. This gives a birth rate of 21.2 per 1,000 population, which is 6.2 per cent lower than the birth rate in these States for the year 1924 (22.6 per 1,000).

The figures for the birth-registration area since 1915 show a considerable decline in the birth rate, which dropped from 25.1 per 1,000 population in 1915 to 22.4 in 1923.

Since 1915, when comparable figures covering a considerable area were first made available, there has been a decided decrease in infant mortality in the United States. In 1915 there were 100 deaths of infants under 1 year of age for each 1,000 births. The rate rose to 101 per 1,000 births in 1916 and again in 1918; then it gradually decreased to 75.6 in 1921. In 1922, the rate was 76.2 per 1,000 births; and in 1923 it was 77.2 per 1,000. These figures are for the birth-registration area, which included 31.1 per cent of the population of the United States in 1915 and 72.2 per cent in 1923.

Reports for 30 States give a rate of 71 deaths under 1 year of age per 1,000 births in 1924 and 71.5 in 1925.

These figures are low as compared with the infant mortality rates of most foreign countries. New Zealand has the best record in this respect, the infant mortality for the year 1923 being 43.8 deaths of infants under 1 year of age per 1,000 births. In England and Wales the rate was 69.3, and in Scotland, 78.9. In Canada, in 1922, the rate was 86.8. Holland in 1922 had an infant mortality rate of 67.3. In Germany, in 1921, the rate was 133.8; in Japan, in 1921, it was 168.3; in Ceylon, in 1923, it was 212.

During the calendar year 1925 smallpox of a virulent type was present in a number of cities in the United States. In most of these communities the disease had been present in mild form for years, there being some cases each year, with occasional epidemics, but very few deaths. Usually during the excitement incident to the epidemics, persons who were known to have been exposed to the disease and some others were protected against the disease by vaccination by health officers or their family physicians. In some cities laws or regulations requiring vaccination before attending school were enforced for a time, but the excitement soon abated after the disease was checked, and vaccination was neglected until the next epidemic.

The typhoid fever death rate in the registration area in 1900 was 35.9 per 100,000 population. The rate declined steadily, and in 1924 it was 6.7 per 100,000. In 1925 there was a reaction. Thirty-



five States reported 5,352 deaths from typhoid fever in 1924, and 7,430 deaths in 1925. It is perhaps significant that nearly all of the increase occurred in rural districts and smaller cities. The cities having 100,000 population or over had nearly the same aggregate rate in 1925 as in 1924.

During the last quarter of a century the death rate from typhoid fever in the death registration area of the United States has been reduced more than 80 per cent; the death rate from tuberculosis about 55 per cent; and the rate from diphtheria, 70 per cent. These are some of the records which sanitarians contemplate with pride, and from which they receive courage for future work. Other communicable diseases show creditable reductions in both case and death rates, but the official records for some diseases are not so encouraging.

The death rates from cancer, diseases of the heart, diabetes, and other diseases are increasing, while automobile accidents, unknown a few years ago, are taking a toll of human life which is appalling. The steady increase in deaths and disablements from this cause each year is disheartening to the person who sees the suffering and loss of life as well as the saving of time in transportation and the greater freedom of movement which the automobile has brought to our people.

#### MEDICAL AND HOSPITAL RELIEF

Hospital care and other medical services have been provided in different ports in the United States, Alaska, and the insular possessions for the treatment of merchant seamen and other beneficiaries of the service. A total of 1,321,309 hospital patient days, 572,139 out-patient treatments, and 91,553 physical examinations were furnished. The number of lepers segregated at the National Leper Home has increased to 259. The Marine Hospital on Ellis Island has continued to admit all sick and detained immigrants whose treatment was requested by the Department of Labor, including an increasing number of alien seamen with venereal and other contagious diseases. The number of merchant seamen and other regular beneficiaries of the service admitted to this hospital now outnumber detained aliens.

#### CONTROL OF VENEREAL DISEASE

The program of venereal disease control which has been built up in the eight years since the creation of the Division of Venereal Diseases has been found, on the whole, satisfactory. The development of the work of this division has followed mainly the duty of cooperating with State boards of health for the prevention and control of venereal diseases within the States and for the study and investigation of conditions influencing the spread of the diseases. Throughout the country there has been built up a unified method of prevention and control of these diseases; more than 900 clinics have been established where scientific treatment is provided to indigent patients without cost or for a nominal fee; educational pamphlets, motion-picture films, stereopticon slides, and exhibits have been made available through each of the State boards of health; standard laws and ordinances have been enacted throughout the country, tending to unify the program of control. A review of the field to be covered



and the work that has been done indicates an outstanding achievement in modern public health effort.

#### COOPERATION WITH OTHER AGENCIES

The Public Health Service cooperates extensively with other agencies—international, Federal, State and local, with volunteer social organizations, and with industrial institutions. Among these cooperative activities may be mentioned the following:

(1) Cooperation with the International Sanitary Office of Paris in attendance at conferences and at meetings of the personnel constituting this office.

(2) With the Health Section of the League of Nations in collecting, publishing, and distributing information of the prevalence of disease.

(3) With the Department of State in examining emigrants abroad and with consular officers in the administration of quarantine.

(4) With other bureaus of the Treasury Department in rendering all medical services for the United States Coast Guard, including examinations for enlistment and retirement and the detailing of medical and dental officers to cutters and bases; issuance of certificates for possession and purchase of medicinal liquors for the Prohibition Unit, Bureau of Internal Revenue; issuance of authority for purchase of narcotics for medicinal use aboard ship for the Narcotic Division, Bureau of Internal Revenue; assistance given the Prohibition Unit in investigations of the relative toxicity of "boot-leg" and commercial liquors; advice and suggestions upon chemicals for inclusion in the schedule of supplies to the General Supply Committee.

(5) With the Departments of War and Navy in rendering medical treatment for designated personnel of the Army Engineer Corps and Mississippi River Commission; medical relief upon official request for personnel of the Army, Navy, and Marine Corps; in cooperative studies with the Marine Corps of the efficiency of Paris green as an *Anopheles* larvacide when spread from an airplane; and lectures by the hygienic laboratory staff members to naval medical student officers.

(6) With the Department of Justice in suppressing fraud.

(7) With the Post Office Department in the supervision of first-aid stations in certain post offices; tests to determine the most efficient system of lighting in post offices; and in the prosecution and prevention of fraud.

(8) With the Department of the Interior in the examination of applicants for the Bureau of Pensions; reorganization of the medical service for the Bureau of Indian Affairs; for the National Park Service in the examination and treatment of a large number of indigent persons afflicted with venereal diseases visiting Hot Springs; in assistance given the National Park Service in designing and installing water-supply systems, sewage-disposal systems, incinerators for the disposal of waste and the like, and in maintaining general sanitary conditions in the national parks.

(9) With the Department of Agriculture in furnishing laboratory facilities and assistance in experimental work and publications;

detail of a sanitary engineer of the Public Health Service, at the request of the chief of the Forest Service, to make a sanitary survey of various parks under the supervision of that service, and to recommend sanitary measures in enforcement of plant and animal quarantines; the work of cooperating with the Bureau of Chemistry in the sanitary control of shellfish, in accordance with the terms of the interstate quarantine appropriation for that purpose; and in conferences held with the Bureau of Animal Industry relative to international standards for tuberculin.

(10) With the Department of Commerce in rendering medical treatment for designated personnel of the Lighthouse Establishment, lighthouse vessels, Coast and Geodetic Survey, and Bureau of Fisheries; cooperation continued with the Bureau of Standards in study of occupational hazards among employees, and with the Bureau of Mines in the detail of a regular medical officer of the Public Health Service to that bureau; study in cooperation with the Bureau of Fisheries of fish control of mosquito breeding; attendance at conferences upon the standardization of thermometers and of disinfection technique of members of the staff of the Hygienic Laboratory.

(11) With the Department of Labor in the examination of immigrants and treatment and detention in hospital of diseased aliens; examination of emigrants abroad.

(12) With the Civil Service Commission in the examination of applicants for appointment and retirement; preparing questions for examinations and rating of papers in several examinations held by the commission.

(13) With the United States Shipping Board in the instruction in first aid and examination of vision and color vision of pilots and other ship's officers for the Shipping Board and other owners.

(14) With the United States Employees' Compensation Commission in the examination and treatment of disabled Federal employees, and in special investigations.

(15) With the United States Veterans' Bureau in the examination and treatment of patients; inspection of well and water supply at Edward Hines, Jr., Hospital, Maywood, Ill.; advice upon the organization and equipment of a scientific research division; the performance of 494 Wassermann tests for hospitals in various parts of the country.

(16) With State and local health and other agencies. Cooperation with States in the control of venereal diseases; cooperation with State authorities in water certification procedure, which work has been conducted in cooperation with the division of sanitary engineering of 29 States; cooperation with the 19 shellfish producing States in the sanitary control of the shellfish industry; cooperative studies of, and demonstration work in, rural sanitation carried out in 89 counties of 20 States, as follows:

Alabama-----	9	Mississippi-----	3
Arkansas-----	2	Missouri-----	13
California-----	3	Montana-----	2
Georgia-----	8	New Mexico-----	8
Illinois-----	1	North Carolina-----	1
Iowa-----	1	Oklahoma-----	3
Kansas-----	4	South Carolina-----	1
Kentucky-----	1	Tennessee-----	6
Louisiana-----	2	Virginia-----	12
Massachusetts-----	1	West Virginia-----	8

This demonstration work in rural sanitation is made a part of the general program of well-rounded whole-time county health service. It results in the development of efficient whole-time rural health departments, which, without such cooperation, would not be developed.

*Eastern States.*—Cooperation on the part of the office of industrial hygiene and sanitation investigations with the State department of labor and industry in the formation of regulations for the control of spray painting in Pennsylvania; study of the municipal water-purification plants in cooperation with certain Ohio River cities; study of the vision of school children and of the natural illumination of school buildings in the District of Columbia; study of the growth of school children of Hagerstown, Md.; state-wide goiter surveys of school children of Connecticut and Massachusetts; survey of school children of Cincinnati, Ohio, and the District of Columbia; and the examination of school children for enlarged spleen as evidence of malaria.

*Southern States.*—Cooperation with the State Board of Health of North Carolina in the reorganization of the division of epidemiology; studies of milk control in cooperation with the States of Alabama, North Carolina, Texas, Virginia, Tennessee, South Carolina, Missouri, Kentucky, Arkansas, and Louisiana; cooperation with the State Board of Health of South Carolina in determining the prevalence of anterior poliomyelitis, and in organizing a division of sanitary engineering of the State board of health; cooperation with the State and local authorities in Florida in prevention of the spread of smallpox; cooperation with the State of Louisiana and the city of New Orleans in plague eradication measures; studies of malaria in cooperation with the States of Mississippi, Virginia, Georgia, and Alabama, also surveys made and advice given in other States where malaria is a problem; study of the physical and mental status of colored children in Atlanta, Ga.; the State health authorities of Georgia, Kentucky, North Carolina, Virginia, and West Virginia asked and received assistance by the detail of a service officer in the diagnosis of remote or unknown infections; cooperation with the Texas State Board of Health and communities along the Texas-Mexican border in mosquito eradication to prevent the possibility of the spread of yellow fever.

*Middle Western States.*—Cooperation with State and local authorities in the maintenance of trachoma hospitals and field clinics for the eradication of trachoma, these hospitals being operated at Rolla, Mo., Russellville, Ark., Eveleth, Minn., and Knoxville, Tenn.; study of the sewage pollution of Lake Michigan in the vicinity of the Indiana-Illinois State line, and of the pollution of the upper Mississippi River in cooperation with the Wisconsin and Minnesota State health departments and the health authorities of St. Paul and Minneapolis.

*Western States.*—Cooperation with the city of San Francisco and the cities and counties in the vicinity of San Francisco Bay in plague eradication work, consisting of (1) the extermination of plague in ground squirrels and rodent control measures, (2) rodent surveys and sanitary inspections in San Francisco, and (3) operation of a laboratory for diagnostic purposes; cooperation with the city of Los Angeles in plague eradication measures, which was undertaken

at the request of the city authorities and consisted in aiding the city in the elimination of rodent plague; minor cooperative assistance given the States of California and Oregon by the office of Stream Pollution Investigation; study of the dental condition of children in a county in New Mexico.

*Hawaii.*—Cooperation with the Territorial Board of Health in leprosy investigations.

With universities, organized social agencies, etc.: Cooperation at various times regarding technical matters with the American Public Health Association, the International Institute of Statistics, Milbank Memorial Fund, National Safety Council, Girl Scouts of the District of Columbia; cooperation with sick benefit associations and medical departments of industrial establishments in studies of the causes of industrial absenteeism; laboratory facilities and other valuable assistance furnished to the Division of Scientific Research in connection with investigations of cancer, pneumonia, municipal health practice, and leprosy by the universities of Harvard, Cornell, Johns Hopkins and Hawaii; cooperation with the Annual Tuskegee Negro Conference and the National Negro Business League in the National Negro Health Week program; conferences with the research committee of the National Tuberculosis Association on plans for new work; investigation of suspected cases of leprosy; in accordance with arrangements, facilities for study and instruction were granted seven representatives of foreign governments holding fellowships under the International Health Board, three being from Hungary and one each from Norway, Italy, Yugoslavia, and Bulgaria, the time spent at the Hygienic Laboratory varying from a week to about three months in individual cases.

Reagents, test sera, or cultures were sent to the following:

#### HOSPITALS

Stanford Hospital, San Francisco, Calif.  
 Theda Clark Hospital, Neenah, Wis.  
 John McCormick Institute for Infectious Diseases, Chicago, Ill.  
 Wesley Memorial Hospital, Emory University, Ga.  
 St. Elizabeth's Hospital, Hannibal, Mo.  
 Jackson Infirmary, Jackson, Miss.  
 South Mississippi Charity Hospital, Laurel, Miss.  
 Johns Hopkins Hospital, Baltimore, Md.  
 Jefferson Hospital, Philadelphia, Pa.  
 Hebrew Hospital, Baltimore, Md.  
 Meriwether Hospital, Asheville, N. C.  
 Children's Hospital, Washington, D. C.  
 Latter Day Saints' Hospital, Idaho Falls, Idaho.  
 Mercy Hospital, Pittsburgh, Pa.  
 St. Luke's Hospital, New Bedford, Mass.  
 Georgia State Sanitarium, Milledgeville, Ga.  
 Methodist Episcopal Hospital, Indianapolis, Ind.  
 New Haven Hospital, New Haven, Conn.

#### EDUCATIONAL INSTITUTIONS

Boston University School of Medicine, Boston, Mass.  
 University of Rochester, Medical School, Rochester, N. Y.  
 University of California, Berkeley, Calif.  
 Medical College of Virginia, Richmond, Va.  
 College of Medicine, University of Cincinnati, Cincinnati, Ohio.  
 Yale University, department of medicine, New Haven, Conn.



University of Kansas, Lawrence, Kans.  
Harvard University, medical department, Boston, Mass.  
Vanderbilt University, medical department, Nashville, Tenn.  
University of Chicago, department of hygiene and bacteriology, Chicago, Ill.  
State University of Iowa, Iowa City, Iowa.  
Cornell University, veterinary department, Ithaca, N. Y.  
Columbia University, department of bacteriology, New York, N. Y.  
Johns Hopkins University, Baltimore, Md.  
Michigan State College, Lansing, Mich.  
Lehigh University, Bethlehem, Pa.  
University of Florida, Gainesville, Fla.  
Wake Forrest Medical School, Wake Forrest, N. C.  
Baylor University, Waco, Tex.  
Rockefeller Institute for Medical Research, New York, N. Y.  
The George William Hooper Foundation for Medical Research, San Francisco, Calif.

## PERSONNEL

Attention is again invited to the necessity of increasing the regular commissioned corps of the service. During the past year Congress recognized this need by appropriating for 10 additional assistant surgeons, intended as a replacement for officers detailed to the work of examining intending immigrants in Great Britain and the Irish Free State. This work has now been extended to other European ports, its desirability and value having been demonstrated to the satisfaction of the State Department, the Immigration Bureau, and Public Health Service officials. At the present time 28 commissioned officers have been sent to various European ports for the medical examination of immigrants. This number, added to officers on duty in connection with quarantine measures at foreign ports and in insular possessions, totals more than 25 per cent of the commissioned corps on active duty.

Authority for additional officers in the regular corps would enable the service not only to train officers to replace those who have completed a tour of duty abroad, but would also permit of a reduction in the number of local appointees and reserve officers now on duty.

The compensation of certain local medical appointees at important immigration and quarantine stations is not commensurate with their responsibilities. On this account resignations have occurred which adversely affected the work. The pay of these officers can not be increased on account of the inadequacy of the appropriations. The appropriations for this purpose should be increased.



## SCIENTIFIC RESEARCH DIVISION

In charge of Asst. Surg. Gen. A. M. STIMSON

The objectives, principles, and general methods regarding the operations of this division have been recorded in previous annual reports.

It will be noticed that the general topics of investigation have remained substantially the same. The reason for this resides in the inclusive nature of these designations rather than in a lack of progress. While it can be foreseen, perhaps, that the time is not far distant when such a disease as malaria may cease to be of major importance in the United States, and consequently no longer in need of intensive study leading to its control, the possibilities of dismissing such a subject as stream pollution within a short period of years would appear more remote. This is due to the appearance of new problems incident to the rapid growth of populations and of industry—problems which for some time will require very serious study if catastrophe is to be avoided.

Thus it has happened in many of these research activities that the solution of one problem has scarcely been consummated before a change in the social or economic situation of the population presents another for investigation. While this may be regretted by those who desire and hope for an early millenium, a sober recognition of fact will lead to the conviction that, unless the human race should stand still, it will continue to offer health problems for solution. The fact that health knowledge actually has kept pace with other advances sufficiently well to result in a diminishing death rate and prolonged life in spite of increasing congestion and what may be designated as an accelerated rate of living should be sufficient guaranty of the essential soundness of scientific methods applied to the solution of health problems.

### CANCER

Investigations of cancer were continued during the fiscal year under the direction of Surg. J. W. Schereschewsky, with headquarters furnished by the Harvard Medical School, Boston, Mass.

In the search for therapeutic agents which might favorably affect the course of malignant growths or be useful in their prevention an almost infinite variety of drugs, serums, and physical agents has been investigated by the medical and allied professions.

*Effects upon living cells of currents of very high frequency.*—While considerable work has been done in the past on the effects on living cells of high-frequency currents generated by the usual form of therapeutic apparatus, the effect of continuous wave oscillations of very high frequency upon living cells has been, if at all, little investigated.

Progress in the construction of vacuum tubes and development of the associated circuits have permitted the generation of oscillating currents of very high frequency.

Since the number of bands in the spectrum of radiation are concerned in biologic phenomena, it was thought that this hitherto unexplored region might well repay investigation. Consequently, the study which was commenced in the last half of the previous year was continued throughout the present year. The first step in this study was the development of oscillating circuits capable of generating oscillating currents of the frequency it was desired to study (230,000,000 to 10,000,000 cycles per second) and of associated apparatus in which laboratory animals or living cells could be suitably exposed. The development of these circuits was carried out at the Cruft high-tension physical laboratory, Harvard University, the facilities of which were very kindly placed at the disposal of this office by the director and assistant director of the laboratory, Profs. George W. Pierce and E. L. Chaffee. This cooperation was of much assistance and is gratefully acknowledged.

Suitable apparatus having been developed for the investigation, the first step of the study was to determine whether change in frequency produced any difference in the effects observed. When living cells were exposed to the displacement current in an electrostatic field profound effects were produced which resulted in the death of the organism. These effects were most marked in a particular band of frequencies extending from a frequency of about 90,000,000 to 10,000,000 cycles per second, the effects on the one hand diminishing with great rapidity for lower frequencies and more slowly for higher frequencies. The detailed results of this part of the study are now in press. Further studies are being at present carried out on the effect of these currents upon the growth of malignant tumor cells, their effects on seed germination, their effects on the growth and development of young animals, and histological studies are being conducted of the morbid changes produced in tissue cells.

*Investigation of the racial mortality from cancer in the United States.*—Since European statistics show great racial dissimilarity in various death rates from cancer (which, however, may, in some part, be due to differences other than racial, as, for example, differences in the methods and accuracy of reporting deaths, differences in medical facilities, and the extent to which they are utilized by different nationalities, and similar factors) an attempt was made to study the racial mortality from cancer in the United States in some particular section where, presumably, the environment would be substantially the same for all races. An intensive study of the metropolitan area in Boston was undertaken particularly with respect to the extent to which the various races present avail themselves of the facilities for medical treatment. Differences in this respect might well cause variations in the recorded death rate of the different races. For instance, if one race were shown to avail itself more readily of medical treatment than another, diagnosis would be earlier, treatment would be earlier initiated, and a higher percentage would have the course of the disease arrested. All the certificates of deaths from cancer which had occurred within the three preceding years were gone over from the records of the city department of health, and personal visits

were made by the field workers to the homes and relatives of the deceased for the purpose of securing the necessary information in regard to medical treatment. This part of the investigation was attended with considerable difficulty because of the fact that, in many instances, relatives could not be found. The data on file at the large hospitals in Boston such as the Massachusetts General Hospital, Boston City Hospital, and the Long Island Hospital were studied, as well as those of the Community Health Association. Seven hundred and eighty complete schedules were secured.

A stumblingblock to the early completion of this study is the fact that up to the present date it has been impossible to secure a distribution of the population according to age and race. Consequently, it has not been possible to verify the apparent result of this study, i. e., that the Italians possess the lowest mortality from cancer of any of the races of Boston, as the apparent low rate in Italians may possibly be due to a different age distribution. It would not appear, so far as Boston is concerned, that there can be any ground for belief that differences in the availability of medical treatment can cause an apparent difference in racial mortality, as all the races appear to be on an equal footing in this respect. The study will be completed as soon as it is possible to secure an age distribution of the population by race.

#### CLONORCHIASIS

Investigations of clonorchiasis are being continued at San Francisco, Calif., under the direction of Surg. N. E. Wayson. The object of the study is to determine whether the liver fluke, *Clonorchis sinensis*, may become prevalent among the lower animals and in man on the Pacific slope. In accordance with the accepted hypothesis of the life cycle of the parasite, its reproduction in snail and fish hosts under laboratory conditions has been the immediate objective during the past year. The method of approach to the problem has been through attempts to maintain in aquaria those conditions which might favor the development of the parasite in the intermediate hosts and through more extended studies of the factors which might favor or produce the hatching of the egg of the parasite.

These latter efforts have been somewhat curtailed during the latter months of the year because of the small number of infected aliens submitted for examination to the chief medical officer of the San Francisco Immigration Station, through whom fresh specimens of ova-containing materials have repeatedly been obtained.

However, previous observations of varying single and combined physical, chemical, and mechanical factors on washed preparations involving many thousand eggs have been extended. The factors included have been the time period, the temperature, light, exposure, and reaction of the suspending medium, the degree of aerobiosis, and the effect of interference with both chemical reagents and mechanical agents. Prolonged exposures for several weeks or months under these varying conditions, as well as abrupt changes, have been studied.

Constant findings which will permit of conclusions as to the manner or possibility of spread on the Pacific slope have not been determined from the experiments made. It has been observed that

both physical and chemical combinations will effect the dehiscence of the egg and the emergence of the contained larval form. Also that eggs which are ingested by snails become dehiscent during their passage through the intestinal tract of the snail. However, consistent spontaneous hatching of these larval forms in an active condition has not been obtained.

During these studies the snails suspected of being the intermediate hosts of the parasite in the areas of both China and Japan in which the disease is endemic have been imported in the dry state, have been kept alive for eight months, and have reproduced in aquaria under laboratory conditions. The feasibility of such importation and adaptation to aquarial conditions may be of significance in the local development of both the snail and the parasite under natural conditions. Other Japanese snails have been imported, through commerce, for aquarial purposes, and in order to establish a local supply, or through carelessness, these have been planted in the local fresh waters of the Pacific slope and have become indigenous. However, the life cycle of the parasite has not been developed in the imported or local snails and fishes which have been maintained in laboratory aquaria during this investigation.

#### GOITER

Goiter studies were continued during the year under the direction of Surg. Robert Olesen. The year was devoted largely to the compilation, study, and presentation of data relating to the effects of endemic goiter as it prevails in Cincinnati. As a result of these studies several interesting contributions have been made to the present-day knowledge of the subject.

*Endemic goiter in Connecticut.*—A survey was undertaken in Connecticut for the purpose of determining the extent and distribution of endemic thyroid enlargement. Surveys made in 28 representative communities included 5,797 boys and 6,608 girls attending high schools and the higher grades of grammar schools. Seven per cent of the boys and 29.4 per cent of the girls examined had thyroid enlargements, but mostly of very slight degree. Owing to the relatively slight incidence of goiter in Connecticut, wholesale prophylaxis is deemed unnecessary. In certain localities, however, preventive measures among adolescent girls have been recommended.

*Endemic goiter in Massachusetts.*—Preliminary thyroid surveys in Massachusetts made by members of the State department of health apparently disclosed foci of goiter endemicity, particularly in the western portion of the State. Subsequently a more intensive survey was made by the Public Health Service, 57 representative localities being visited. In all, 7,140 boys and 10,057 girls were examined for evidence of thyroid enlargement. The percentages of thyroid enlargement, 8.7 per cent among the boys, and 22 per cent among the girls, approximate very closely, as might be expected, the Connecticut figures. At the close of the year the data accumulated during the Massachusetts survey were in the process of compilation and study.

*Endemic goiter and intelligence.*—In an effort to determine the influence of endemic thyroid enlargement upon intelligence, 1,902



boys and 1,894 girls in the sixth grade of the Cincinnati schools were studied. Analysis of chronological age data indicative of school retardation or advancement failed to reveal significant variations between thyroid-normal and thyroid-enlarged children. Furthermore, a comparison of percentile ranks, obtained by the application of intelligence tests, failed to show differences of sufficient magnitude to warrant the conclusion that the thyroid normal have a keener mentality than the thyroid enlarged.<sup>1</sup>

It is to be understood that these findings and others based on individual surveys may prove to apply only to the particular conditions locally encountered, and no attempt is made to generalize from them.

*Goiter and potential foci of infection.*—It is frequently stated in the literature that goiter is due to foci of infection, such, for instance, as reside in decayed teeth and diseased tonsils. In order to gain some information upon this point, a study was made of the thyroids, teeth, and tonsils of 1,341 white boys and 1,576 white girls in Cincinnati. Some degree of thyroid enlargement was present among 38.4 per cent of the boys and 58.8 per cent of the girls. A careful study of the material gathered during this investigation failed to disclose a definite relationship between thyroid status and potential foci of infection presumably located in decayed teeth and enlarged or cryptic tonsils.<sup>2</sup>

In a later study in Connecticut along the same lines different results were obtained. This investigation, made during a thyroid survey, disclosed some degree of enlargement among 7 per cent of the 5,797 boys and 29.4 per cent of the 6,608 girls examined. Analysis of the data gathered showed that slightly and markedly decayed teeth, as well as hypertrophied and cryptic tonsils, were more frequently associated with thyroid enlargement than with normal thyroid conditions. Consequently it may be that oral prophylaxis is an aid in preventing thyroid enlargement.

*Endemic goiter and physical development.*—Inasmuch as many writers have reported that thyroid enlargement is associated with retarded physical growth, a study was made among Cincinnati school children to determine this point. Ten uniform measurements were made of each child included in the investigation. Despite obvious limitations, the study apparently showed that children with normal thyroid glands have a slight superiority in certain physical measurements. Consequently it may be assumed that thyroid-normal children are, to some extent, better developed. Thyroid-enlarged children, however, appear to have the advantage in slightly greater height, particularly in the sitting position.

*Endemic goiter and school absenteeism.*—Records of absenteeism among a comparatively small number of children in the sixth grade and open-air classes of the Cincinnati schools disclosed much information of interest. In the group observed absence from school was slightly greater among the thyroid-normal children. Incidentally it was found that absence because of common colds was slightly more frequent among the girls. Contrary to the findings of other observers, the limited Cincinnati study showed that the average absence on account of common colds was slightly greater among the

<sup>1</sup> Reprint No. 1081 from the Public Health Reports, May 21, 1926.

<sup>2</sup> Reprint No. 1069 from the Public Health Reports, Mar. 26, 1926.



children attending the open-air classes than among those in the regular classrooms.

*Conference of consultants.*—In order that the service representatives engaged in goiter investigations may benefit from the experience and guidance of experts, a consulting board has been constituted. This board, composed of Drs. David Marine, of New York City; H. S. Plummer, of Rochester, Minn.; and T. B. Beatty, of Salt Lake City, Utah, had one meeting with the service officers. At this session past work was evaluated and plans were laid for future activities.

*Incidence of goiter in the United States.*—Our present knowledge of the distribution of endemic goiter in the United States is based largely upon the results of the draft examinations. The office of goiter studies is supplementing this information with records of thyroid surveys obtained from various sources. In addition to reports of surveys in the literature many additional records were secured by corresponding with all State, county, and municipal health officers in the country. These data are being tabulated and constitute the most complete information now available concerning intrastate as well as interstate distribution of endemic goiter.

*Iodine determinations.*—The enunciation of the iodine-deficiency theory of goiter causation has directed the attention of many health officials to the iodine content of drinking water and food. Circularization of health officers regarding iodine determinations revealed a great deal of interest and a few reports of results. However, it is apparent that present methods of determining iodine content are difficult of application, require costly apparatus, and are only approximately accurate in their results. Consequently chemical research is required to improve the situation.

*Goiter references.*—An important function of the office of goiter studies of the Public Health Service is that of answering inquiries relating to various phases of the goiter problem. These questions come from all portions of the country and have a wide range. In order to meet this demand, the current goiter literature is carefully indexed and important articles are abstracted. Many reprints have been obtained from authors of goiter articles and are available for reference.

In order to enlist the interest among the medical profession and health officials in this widely prevalent abnormality and to secure the collection of data by more or less uniform and comparable procedures, a large number of professional and scientific meetings have been addressed on the subject.

## INFLUENZA

The office of influenza investigations continued under the general direction of Surg. J. G. Townsend during the fiscal year 1926. He was assisted by a board composed of Surg. W. H. Frost, chairman, with himself as member, and Statistician Edgar Sydenstricker as recorder.

The work was devoted chiefly to the editing, coding, and tabulation of the large mass of information collected prior to July 1, 1925, from approximately 14,000 college students, to the continuation of the collection of records of respiratory attacks in families of medical

officers of the United States Army, Navy, and Public Health Service and members of the faculties of certain medical schools, and to the editing and coding of the records from these families which had been collected during the preceding year. The basic tabulations for the general results of this study have been completed for the college students and for medical officers for the year 1924 and partially completed for 1925.

In the collection of these records and in their coding and tabulation prior to 1926 valuable assistance was rendered by the influenza commission of the Metropolitan Life Insurance Co.

The case records obtained from college students in different localities are being utilized for two general purposes:

(1) The records of 11,750 students, of cases occurring within the period October 1, 1923, to June 30, 1925, have been tabulated in order to determine the rates of prevalence for each diagnosis in the different localities, their seasonal variation, and the synchronism of their short-time variations. The results of this analysis will be published in considerable detail, but it is of interest to note that there was a general similarity in the rate of prevalence in each locality and that the major variations in incidence in widely scattered localities were synchronous, thus confirming the indications referred to in a previous report which were based on a preliminary and partial tabulation.

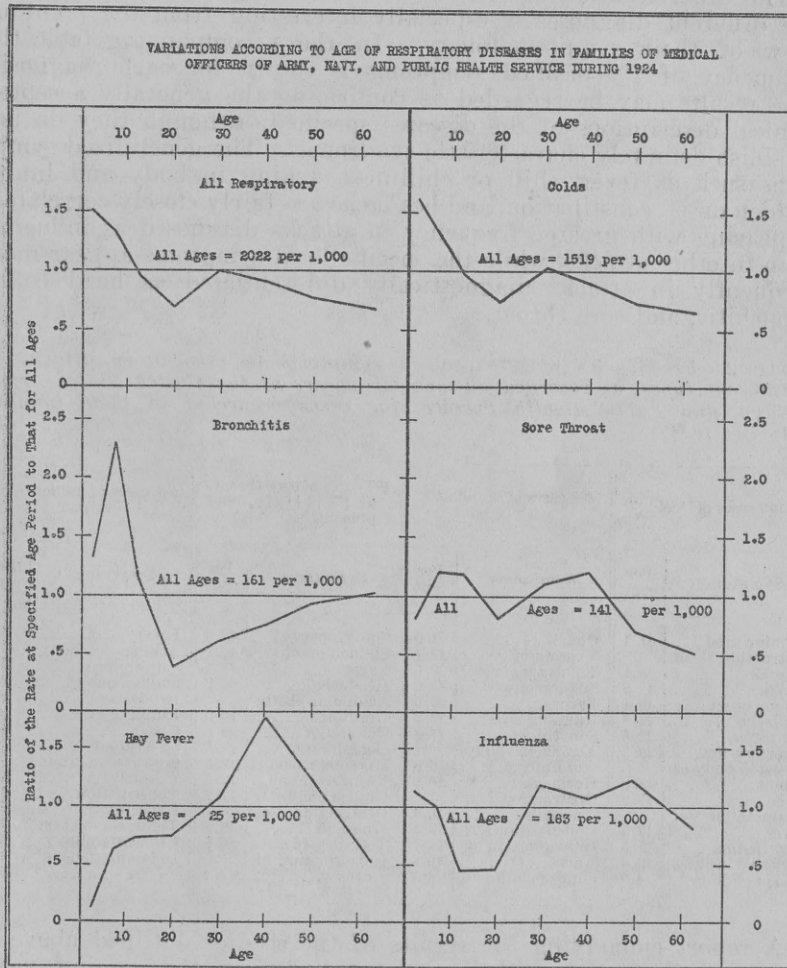
(2) The case records of about 2,000 individual students were subjected to a more detailed analysis. These individuals were selected because of the regularity and continuity of their reports and because they remained throughout the calendar year 1924 in the same localities. The principal objectives of this study were to determine as definitely as possible to what extent the cases reported under different diagnoses, such as colds, bronchitis, sore throat, influenza, etc., were clinically differentiated; to compare the symptomatology for each diagnosis in different localities and at different seasons, and also with respect to the duration of illness, the gross attack rate, and seasonal distribution; and to correlate the frequency and severity of the attacks with certain facts in the previous history of the individual. This tabulation has been practically completed and the preparation of a report is now under way.

The reports from the families of medical officers of the Army, Navy, and Public Health Service and of members of the medical faculties in certain universities were discontinued on June 30, 1926. They were begun in the latter part of 1923 and thus cover more than two complete years. In view of the facts that about 1,500 such families reported with a fair degree of regularity throughout the period, that they were persons of both sexes and all ages, and that the diagnoses were made by medical men in practically all instances, these records are believed to be exceptional in the epidemiological study of respiratory diseases. The preparation of the records for the year 1924 for tabulation has been completed. It is expected that the remainder of the records will be ready for tabulation within a few months.

In these families the incidence rate during 1924 of all respiratory attacks was 2.02 per person. Expressed as rates per thousand persons observed for a period of one year, the incidence of 5,052 attacks classified according to diagnosis among persons of different sexes was as follows:

TABLE 1.—Incidence of respiratory attacks of different types in families of medical officers of the U. S. Army, Navy, and Public Health Service during 1924

Diagnoses	Rate per 1,000 in 1924		
	Both sexes	Males	Females
All respiratory attacks.....	2,022	2,089	1,961
"Colds" in head or nose.....	1,519	1,564	1,476
Bronchitis.....	161	175	148
Tonsillitis, pharyngitis, and sore throat.....	141	140	142
Influenza.....	183	164	174
Hay fever.....	25	22	29



The tabulations of the 1924 experience of this population show the age incidence of respiratory attacks of different kinds. A more complete report is in process of preparation, but the diagram shown above may be of special interest.

The age curves shown in this diagram may be regarded as characteristic of all diagnoses with the exception of tonsillitis, since similar curves have been indicated for comparable diagnoses from statistics obtained from entirely different sources by the offices of child hygiene, industrial hygiene, and statistics. The characteristic tonsillitis curve, as determined by these other sources of information, shows that tonsil defects and tonsillitis are confined almost entirely to persons of younger ages; the curve shown in the accompanying diagram for tonsillitis and sore throat, however, is not inconsistent with the other results because of the relatively low prevalence of tonsillitis in this particular group of persons who have been tonsillectomized to an unusual extent.

The differentiation of attacks classified by medical officers under the different diagnoses is especially interesting from the point of view of their symptomatology. In the accompanying table the frequency of 13 specified symptoms is shown for each diagnosis. The results may be regarded as confirming the generally accepted clinical descriptions of the diseases specified, although they do not establish definitely characteristic syndromes. The generalized symptoms such as fever, chill or chilliness, aching in body and limbs, sudden onset, constipation, and headache are fairly closely correlated, appearing with greater frequency in attacks diagnosed as influenza than in other attacks, while the specific local symptoms appear most frequently in attacks diagnostically differentiated as head colds, bronchitis, and sore throat.

TABLE 2.—Frequencies of 13 specified symptoms in respiratory attacks of different types, as recorded by medical officers of the United States Army, Navy, and Public Health Service, for cases occurring in their families during 1924

5,210 cases of "colds"		489 cases of bronchitis with cough		497 cases of sore throat, tonsillitis, and pharyngitis		599 cases of influenza or grippe	
Symptoms	Per cent	Symptoms	Per cent	Symptoms	Per cent	Symptoms	Per cent
Running nose.....	81.4	Cough.....	91.0	Sore throat.....	82.5	Fever.....	75.6
Obstruction of nostrils.....	48.1	Expectoration.....	42.7	Sudden onset.....	45.1	Aching in body or limbs.....	69.9
Cough.....	42.8	Tightness of chest.....	36.6	Fever.....	41.9	Sudden onset.....	59.6
Sudden onset.....	40.4	Sudden onset.....	35.6	Headache.....	31.2	Headache.....	58.8
Headache.....	22.6	Fever.....	29.0	Aching in body or limbs.....	29.0	Running nose.....	56.8
Sore throat.....	22.5	Running nose.....	29.0	Cough.....	26.0	Cough.....	54.8
Expectoration.....	20.5	Sore throat.....	17.8	Constipation.....	17.5	Sore throat.....	39.6
Aching in body or limbs.....	18.0	Aching in body or limbs.....	16.8	Expectoration.....	13.5	Obstruction of nostrils.....	39.4
Fever.....	17.9	Headache.....	16.6	Running nose.....	12.5	Constipation.....	27.5
Inflammation of eyes.....	12.0	Obstruction of nostrils.....	16.4	Chill or chilliness.....	11.7	Expectoration.....	26.4
Constipation.....	11.5	Constipation.....	13.7	Obstruction of nostrils.....	8.2	Tightness in chest.....	26.0
Tightness in chest.....	10.8	Inflammation of eyes.....	10.4	Tightness in chest.....	5.8	Chill or chilliness.....	25.7
Chill or chilliness.....	4.5	Chill or chilliness.....	6.5	Inflammation of eyes.....	3.4	Inflammation of eyes.....	18.0

A report embodying the results of the studies outlined above is in preparation and will be presented during the coming year. Upon the completion of this report it is planned to analyze the data further for the purpose of carrying on certain more specific inquiries, such as the determination of whether or not any association exists between short-time variations in the incidence of re-



spiratory attacks of different types and variations in the meteorological conditions in the same localities, the relationship, if any, between the respiratory attacks experienced by various individuals during the period of record and previous history of respiratory attacks, of dietary habits, and of physical exercise. A large number of the family records are being studied from the point of view of the sequence of cases at different times of the year and in periods of apparently epidemic and nonepidemic conditions.

#### LEPROSY INVESTIGATION STATION

Surg. M. H. Neill continued as director of the leprosy investigation station, with headquarters at Kalihi, Honolulu, near the Territorial Hospital for Lepers. Medical treatment of these patients was furnished by officers from the investigation station and research work on some of the problems of leprosy was conducted. The University of Hawaii has continued its generous policy of furnishing space in its chemical laboratory for the manufacture of chaulmoogra derivatives for the treatment of leprosy and for the preparation of new compounds under the supervision of its chemists.

*Clinical observations.*—There were 130 patients in the hospital July 1, 1925. During the year 91 patents were admitted, 17 were paroled, 3 died, and 42 were transferred to Molokai. The number of patients in the hospital at the close of the year was 159. Twenty of the cases admitted during the year were returned parolers. During the period July 1, 1921, to June 30, 1925, the yearly average admission was 95.5. Classifying into early, moderately advanced, and advanced stages of leprosy, the results were as follows: Early, 12; moderately advanced, 44; advanced, 39.5. During the past year 15 early, 43 moderately advanced, and 33 advanced cases were admitted.

For the fiscal year 1925-26 the distribution was as follows:

Hawaiian.....	33
Japanese.....	12
Part Hawaiian.....	10
Chinese.....	9
Filipino.....	9
Chinese-Hawaiian.....	9
Portuguese.....	4
German.....	2
Porto Rican.....	1
Japanese-Hawaiian.....	1
Scotch.....	1
Total.....	91

Sixty-seven of the admissions were males and 24 were females.

In 7 of the 17 persons paroled during the year the leprosy bacillus was never detected. It has been present in the remainder. The average duration of segregation for the parolers was one year and nine months. Ten were males and seven were females.

During the past five years, in order to obtain parole a patient must have shown absence of leprosy bacilli for three successive examinations at three months' intervals and have shown no clinical evidence of activity during the same period. From September 1, 1920, to September 1, 1924, 394 cases of leprosy were admitted. Up to the

present time 133, or 33.75 per cent, have been paroled and 29, or 21.80 per cent of those paroled have returned to segregation.

The treatment of practically all patients with weekly intramuscular injections of from 1 to 3 cubic centimeters of the mixed ethyl esters of chaulmoogra oil, plus one-half of 1 per cent iodine added to the esters before sterilization, has become a well-established routine at this station and has been continued both in the hospital and for the treatment of paroled persons. Some cases have been treated with iododihydrochaulmoogric acid, the preparation of which was mentioned in the previous report. A recrudescence of cutaneous symptoms followed its use in most instances, possibly on account of its high iodine content.

During the year 219 patients in the hospital received a total of 5,575 intramuscular injections; also 173 paroled patients received 2,354 treatments at the out-patients' department at Kalihi Hospital or by Territorial physicians on other islands.

Studies of the effect of radium on the leprous lesions of the nose have been completed. There were 32 cases treated with radium and 21 lepers observed as controls. It was concluded that radium was generally effective in removing the nodules of leprosy from the nasal cavity; that it was not a reliable agent for ridding the nose of leprosy bacilli; and that it should only be used in the nose when special indications exist. Its use as a routine is not advised, the more so as septal perforations were not uncommon after its use.

Studies of the leprous lesions of the eye have been inaugurated by Dr. F. J. Pinkerton, ophthalmologist to lepers for the Territorial board of health. Especial attention has been given to the effects of plastic operations on the lids.

A study of the best methods of dealing with perforating ulcers of the feet has been made and improvement in technique has resulted.

The records of 405 lepers admitted to Kalihi Hospital were analyzed, with special reference to the presence of thermoanesthesia independent of definite lesions of the skin. Tests were made of the disturbance of hot and cold sensation along the external margins of hands, forearms, feet, and legs.

The following table gives information of some degree of thermoanesthesia in these regions among the following groups of lepers:

*Thermo-anesthesia among groups of lepers*

	Nodular			Neural			Mixed		
	Early	Moderately advanced	Advanced	Early	Moderately advanced	Advanced	Early	Moderately advanced	Advanced
Present.....	8	24	41	29	66	35	9	79	70
Absent.....	3	9	11	6	5	1	3	5	1
Total.....	11	33	52	35	71	36	12	84	71
Per cent present.....	72.7	72.7	78.8	82.8	92.9	97.2	75	94	98.5

As might be expected, the largest percentage showing some thermoanesthesia occurred among the well-marked cases of neural and

mixed leprosy. However, it is important to note that 75 per cent of those classified as nodular lepers showed disturbances of hot and cold sensations somewhere in the distribution of the ulnar and internal cutaneous, or peroneal and external saphenous nerves. This serves to illustrate the fact that demonstrable involvement of the nervous system is present in the great majority of lepers.

In our experience at Kalihi involvement of the nervous system occurs more frequently than does the demonstration of the leprosy bacillus at entrance, which was found in only 63 per cent of lepers admitted during the period of study. It may be stated that the procedure in vogue for segregating lepers in Hawaii makes the possibility of the entrance of a nonleper to Kalihi Hospital very remote.

During the year a study of the protein constituents of the blood in leprosy has been made. A review of the literature reveals that few extensive studies of this nature have been made on persons ill of infectious diseases since the adoption of accurate laboratory methods. About 150 tests on lepers have been made, 50 tests on normal soldiers, and a number of tests on individuals sick with typhoid fever, pneumonia, and tuberculosis. The data obtained are in process of analysis.

A number of attempts have been made to cultivate leprosy bacilli obtained by incising the skin of lepers. Partial tension methods and a variety of media containing different amino-acids were used. Rigorous precautions were observed against introduction of contaminating organisms. No proliferation of leprosy bacilli was observed, although they were proved present in abundance on the culture media.

The preparation of special chaulmoogra derivatives has been given less prominence than in former years on account of the rather unsatisfactory therapeutic results from the ethyl esters of chaulmoogra oil.

The preparation of chaulmoogryl alcohol, however, has at least considerable academic interest. This has been accomplished by the reduction of ethyl chaulmoograte with sodium.

Several reports from the Orient have been received of the substitution of oils derived from *Hydnocarpus wightiana* and *Hydnocarpus anthelmintica* for chaulmoogra oil from *Taraktogenous kurzii* in the therapeutics of leprosy. Samples of these hydnocarpus oils have been obtained. They appear to be equal in chemical reactions and superior in physical properties to chaulmoogra oil. What, if any, therapeutic effect these oils may have in leprosy remains to be determined by clinical trial, now begun. The following amounts of the mixed ethyl esters of chaulmoogra oil have been prepared and distributed as follows:

	Cubic centimeters
Ethyl esters manufactured.....	28,250
Balance on hand June 30, 1925.....	6,000
	<hr/> 34,250
Amount distributed to—	
Kalihi Hospital.....	21,000
Board of health.....	5,500
Cuban consul.....	500
	<hr/> 27,000
Balance on hand June 30, 1926.....	7,250
14656—26—3	

*Epidemiological studies.*—During the year a statistical study was completed of the occurrence of leprosy in families some of whose members entered segregation 1911–1920. For the purposes of this study only members of families, viz, father, mother, husband, wife, brother, sister, son, and daughter were considered. The records would not justify a study of other relationships.

During the period 1911–1920 representatives of 742 families were declared lepers. The records indicate that there were in these families 3,662 nonleprous relatives resident in Hawaii. During the period 1911–1925, 167, or 4.56 per cent, of these relatives were declared lepers.

The attack rates among the relatives were as follows: Sons or daughters, 6.35 per cent; brothers or sisters, 5.47 per cent; husbands or wives, 2.45 per cent; mothers or fathers, 1.48 per cent. One hundred and forty-nine, or 89.22 per cent, of all secondary cases segregated occurred among the sons or daughters or brothers and sisters of first cases segregated.

Of 121 families with more than one case entering segregation 1911–1925, 112, or 92.56 per cent, were Hawaiians or part Hawaiians.

The census of 1920 states the Hawaiian and part Hawaiian population of the Territory to be 41,750. During the period 1911–1925 there were 814 persons of Hawaiian blood entering segregation, or an attack rate of 1.95 per cent. Thus it would appear that the attack rate in leper families is somewhat more than twice as great as in the general population of a similar race—that is, Hawaiian or part Hawaiian.

The total population of the Territory for 1920 was 255,912. During the period of 1911–1925 there were 1,161 new cases of leprosy recorded or 0.45 per cent of the general population. According to this comparison, the incidence of leprosy was ten times as great among the relatives of lepers entering segregation 1911–1920 as among the general population.

The following table gives information as to the children living with lepers segregated during the year. What proportion of these will eventually develop leprosy is an interesting speculation.

*Number of patients admitted to Kalihi Hospital from July 1, 1925, to June 30, 1926, having children in household*

Patients with children.....	62
Patients without children.....	27
Patients without data.....	2
Total.....	91
Number of children.....	181

*Age of children*

Age (years)	Male	Female	Total
0-5	31	28	59
5-10	25	30	55
10-15	21	16	37
16-20	12	18	30
Total....	89	92	181



Acknowledgement is made to the Territorial board of health for providing radium for the treatment of nasal leprosy.

### MALARIA

The study of the malaria problem of the United States was continued during the year under the general direction of Surg. L. D. Fricks, with headquarters at Memphis, Tenn.

From the initiation of these studies in 1914 it has been the policy of the service to undertake first the solution of the most serious and practical problems, leaving minor and less pressing subjects for future development. The extent of the malaria problem in the United States has permitted such selection, and the character of the malaria allotment has rendered it necessary. It is a source of gratification, therefore, to report that two important malaria problems so nearly reached the point of solution during the year that their further study was discontinued and other subjects were substituted for them in the program of malaria investigations. These were epidemiological studies of malaria and studies of fish control of mosquito production. Other major malaria studies which are being continued include rural malaria control, *Anopheles* habits, larva foods, larvicides, impounded waters in relation to malaria, screening, and drainage.

*Epidemiological studies of malaria.*—The great difficulties attending the problem of when, where, and under what circumstances malaria is occurring in the United States have always been recognized by public-health officials. In 1921 the service began a determined effort to solve the major epidemiological problems of malaria in the United States. An officer especially trained in epidemiological methods was assigned to these studies, which have been continued for five years. A careful study of malaria morbidity and mortality reports in the Southern States was made; the State health departments concerned were assisted in correcting faulty reporting of malaria and improving their methods of collecting malaria statistics. Special surveys of endemic malaria centers and epidemics of malaria were made from time to time. More than 20,000 school children in 11 Southern States were examined for evidences of malaria infections, including histories of previous infection, enlarged spleens, and blood for malaria plasmodia. In connection with these studies and as an aid to accurate diagnosis 9,106 blood smears were examined for malaria parasites during the year. *P. vivax* was found in 254 of these, *P. falciparum* in 433, *P. malariae* in 2, and both *P. vivax* and *P. falciparum* in 2. As a result of these studies the following general conclusions have been reached:

A great reduction in malaria prevalence has taken place in the United States within the past 50 years. The rate of malaria reduction has increased in the last half of this period. At the present time malaria is practically confined in its distribution to the South Atlantic coastal plain, the Gulf coast, and the lower Mississippi Valley, and even in these regions the distribution of the disease is focal in character. In localities where malaria was formerly prevalent many minor ailments are still called malaria—this is the "traditional" malaria so commonly encountered throughout the

South. Areas of high-malaria prevalence are found chiefly along the river bottoms and around swampy areas in the Southern States. Should the same reduction rate as that noted during the past five years continue, malaria will cease to be of public-health importance in the United States within the next 50 years.

*Fish control of mosquito production.*—In 1918 the Bureau of Fisheries and the Public Health Service undertook a cooperative study of this important subject. Ichthyologist Samuel F. Hildebrand was detailed by the Bureau of Fisheries to make this study, and many observations were contributed by the malaria field personnel of the service. The investigation was continued each summer through 1925, when it was discontinued as having been practically completed. During the course of these studies observation stations were located at Augusta and Savannah, Ga., and in the summer of 1925 at Greenwood, Miss., and, in addition, numerous fish surveys were made of impounded waters, natural ponds, and streams from Virginia to Texas. All larva-eating fish of this region were investigated and a thorough study of the life history and habits of *Gambusia affinis* was made. Many important new facts were discovered concerning this little fish. The general conclusions of these cooperative fish studies are as follows: *Gambusia affinis* is the most efficient of the American fishes in the control of mosquito production. Mosquito larvæ constitute a large part of its normal food. It is viviparous, propagates rapidly, and can be transported even for long distances with ordinary care. For these reasons, under favorable conditions *Gambusia affinis* will control mosquito production. Where conditions are less favorable much can be done by cleaning away flitage and vegetation and by protection from larger fish to make *Gambusia* effective in destroying mosquito larvæ. *Gambusia*, however, can not be depended upon to control mosquito production in all bodies of water under all conditions. They should be employed intelligently, as should all antimalarial measures, and given help when needed.

As a result of these fish-control studies *Gambusia* hatcheries have been established by State and local health departments, industrial corporations, and private individuals throughout the Southern States, and shipments of *Gambusia* have been successfully made to California, Spain, Italy, Yugoslavia, Greece, Palestine, the South American countries, and Hawaii, where they are being used to destroy mosquito larvæ.

*Studies of rural malaria control.*—The practical objective of all service malaria investigations has been the control of malaria in the United States, which, in the last analysis, means rural malaria control. During the fiscal years of 1924 and 1925 rural malaria-control studies were conducted on an extensive scale in many Southern States, with service officers cooperating with county health officers in locating malaria foci and observing the results of malaria-control measures selected as suitable to local conditions. At the beginning of the fiscal year 1926 it was necessary to transfer these field officers to other public-health activities, and hence these studies of rural malaria control were greatly restricted, being confined this year to six counties in Virginia and one county in Mississippi, and surveys of particular rural malaria control problems as made from time to

time from malaria field headquarters at the request of State and county health officers.

The study of malaria in Leflore County, Miss., is of peculiar interest in that a typical county of the Mississippi Delta, that region of the United States in which malaria is now most prevalent, was selected. An officer was stationed in this county and given opportunity to keep in close touch with the malaria situation and study the changes in malaria prevalence which may take place from year to year. Thus by making an intensive study of a typical county over a period of several years it is expected that this office will be able to measure the fluctuations in malaria which occur and determine the causes which produce them and then apply this information to the control of malaria elsewhere in the United States.

*Studies of anopheline mosquitoes.*—Two field laboratories were operated during the year, one at Savannah, Ga., and one at Greenwood, Miss., for study of anopheline mosquitoes in their natural environment. Associate entomologist Bruce Mayne directed the Savannah laboratory and made special observations of *A. crucians* in relation to malaria transmission. A survey of the Okefenokee Swamp in south Georgia was made by Mr. Mayne. In the territory of the swamp, embracing approximately 720 square miles, more than 10,000 mosquitoes were examined and all identified as *A. crucians*. No malaria was found in this locality, where only *A. crucians* were present, although the mosquito infestation was enormous. Mr. Mayne also made a mosquito survey around Lakeland, Fla., finding some infected *A. quadrimaculatus* and no infected *A. crucians*. In these surveys no positive evidence was found incriminating *A. crucians* as a malaria vector. It must be remembered, however, that *A. crucians* infected with malaria plasmodia have been found in nature.

An extensive series of observations dealing with *Anopheles* production, habits, and destruction have been conducted under the direction of Dr. M. A. Barber from the Greenwood, Miss., field laboratory. Studies of egg hatching and larva development as influenced by pH concentration and the study of the influence of larva foods upon development have been carefully and thoroughly conducted. A large number of larvicides have been tested and their relative values established. The most satisfactory *Anopheles* larvicide discovered by Doctor Barber is Paris green, first used for this purpose and reported on by him in 1921. Further studies of Paris green have only confirmed and extended its usefulness as an *Anopheles* larvicide. Doctor Barber was requested to visit southern Italy and Yugoslavia in the late summer of 1925 in order to inspect the Paris green larvicidal work which was being done in those countries and give advice concerning the use of this larvicide. Owing to the restricted mosquito-producing areas in those countries as compared with the southern United States it was found that Paris green has proved even more successful there than with us, and it appears possible to control absolutely *Anopheles* production in southern Italy and Sicily by this measure alone.

Around Quantico Marine Barracks an investigation is being made of the efficiency of Paris green as an *Anopheles* larvicide when spread from an airplane. In the Potomac River, just off the barracks, large

masses of floating eelgrass (*Zostera marina*) are found. These produce anopheline mosquitoes in enormous numbers, and heretofore no feasible method of controlling mosquito production in them has been known. The Chopawamsic swamps near by are almost as inaccessible as the floating islands of eelgrass. Apparently an easy, inexpensive, and effective method of destroying *Anopheles* larvæ in these inaccessible areas has been discovered in Paris green spread from airplanes.

Malaria and mosquito surveys have been made throughout the year in Leflore County, Miss., by the personnel of the Greenwood laboratory. The data gathered will be of great value as a part of the study of rural malaria control in Leflore County.

A malaria survey of the negro population of Gary, Ind., was made in September, 1925. One hundred and seventy-four persons were examined, of whom 14 were found to have malaria parasites in their blood. This is an interesting finding in view of the extensive movement which has taken place of negro farm labor from the South to northern industrial centers.

In a malaria survey of 47 Mexican cotton pickers recently arrived in Mississippi from southwest Texas it was found that 10 of these Mexicans had malaria parasites in their blood. This survey is of interest to State health officials and to the general public because of the frequent and extensive movement of farm labor in the southwestern part of the United States.

*Studies of impounded waters.*—Studies of impounded waters in relation to malaria were continued during the year. A detailed study of the impounded water malaria problem of Alabama was completed at the beginning of the year. In this study an officer was assigned to keep under continuous surveillance a series of impounded waters in Alabama having different physical and biological characteristics. *Anopheles* production in these lakes was studied and suitable measures of control were developed. In connection with these studies an apparatus for spraying oil under pressure by means of precharged compressed air tanks was devised. This apparatus will effect a great saving in time and labor on large impounded water projects. The officer in charge of these studies also cooperated with the State health department in enforcing the State regulations governing impounded waters. In this way it was possible to estimate the value of these regulations in the control of malaria and make practical suggestions as to their enforcement.

In the tidewater region of Virginia 13 small impounded lakes or ponds were used experimentally to determine the feasibility of controlling mosquito production by fluctuation of the water level. The water level in these ponds was lowered from 12 to 18 inches at successive intervals, and by this means the shore lines of the ponds were kept relatively free of vegetation and stranded débris. As a result mosquito production along the margin of the ponds was greatly reduced. It was found that in this type of pond, where there is little flottage or aquatic vegetation scattered over the surface of the pond and where, consequently, mosquito production is confined to the margin of the pond, fluctuation intelligently employed is a valuable means of mosquito control.

At the request of the State health officers concerned, Senior Sanitary Engineer J. A. Le Prince from time to time inspected a number



of large impounded water projects in Virginia, North Carolina, South Carolina, Georgia, Tennessee, and Missouri. These impounded water projects have been established either for the development of hydroelectric power or in connection with city water supplies in Southern States. Advice was furnished to the State health officials and to the developmental agencies as to the proper precautions which should be taken to prevent *Anopheles* production and malaria transmission around these artificial lakes. The rapid progress which has been made in the development of hydroelectric power in the Southern States during the past 10 years has been accelerated by the studies which the Public Health Service has made of impounded waters in relation to malaria. The general principles involved in the control of mosquito production in impounded waters have been determined and have been embodied in State health department regulations of the Southern States in which the impounding of water on a large scale is being undertaken.

*Drainage studies.*—Elimination of *Anopheles* breeding places by proper drainage has been one of the major malaria problems investigated by the service. Major drainage, minor drainage, vertical drainage, subsoil drainage, and construction and maintenance of drainage ditches have all been studied by service investigators, and generally satisfactory although not absolutely final conclusions have been reached in regard to these matters.

During the past year, because of limited personnel, drainage studies were confined to the subject of vertical drainage in the Mississippi Delta region. It has been shown that in limestone regions vertical drainage can be frequently employed effectively and at a very small cost as compared with the cost of surface drainage. Often by boring a hole 10 to 12 feet deep in a limestone sink and exploding a charge of dynamite at the bottom of the hole a seam can be loosened in the bedrock and efficient drainage provided at a very small cost. During the past year observations were made in the Mississippi Delta with a view to determine whether the same principle of vertical drainage might be employed in this region. Test holes 4 to 6 inches in diameter were bored reaching down to the water bearing sand stratum. Usually a depth of from 15 to 20 feet was required. These shallow wells were located in proximity to a small body of water, and effort was made to secure drainage of the water through the well into the porous sand below. The results of these observations so far have not been encouraging.

*Screening studies.*—Studies of the value of screening as a protection against malaria in rural communities of the Southern States and the most practical means of accomplishing it have been continued in Leflore County, Miss. Data so far collected indicate that in areas of high malaria prevalence families living in unscreened homes have more malaria than those living in screened homes, that the economic loss to the tenant families from malaria is greater than the cost of screening, and that the care given to the protection of screens on an average negro farm tenant home is much greater than is usually expected. Various qualities of screening material are being studied in order to determine their efficiency, longevity, and relative cost. Different types of window and door screens, different methods of fitting them, and the relative efficiency of varying the amount of screening employed are under observation.

The farm-labor shortage situation in some sections of the South has become acute. In some counties the labor shortage has interfered with the gathering of farm crops, resulting in a considerable loss. Malaria contributes greatly to inefficient labor and plays an important part in this loss. To combat this unsatisfactory situation numbers of Mexican laborers are now being employed, following the ripening crops from southwest Texas as far east as Mississippi. This migratory farm labor may become an important factor in the spread of malaria even into localities where malaria does not now prevail. For all of these reasons the study of screening of farm houses as a protection against malaria and the consequent improvement of living conditions in the farm home are of great importance to the welfare of the South and to the United States at large.

Detailed reports relating to these studies have been published from time to time and form a part of the service malaria literature, which is in great demand by those who are interested in the malaria problem of the United States.

#### NUTRITIONAL DISEASES

The very important subject of human nutrition is being approached from many different angles at various research institutions throughout the world. It happens that the Public Health Service has access to exceptional facilities for the investigation of one major nutritional disease, and, as in the past few years, it has continued to utilize these facilities during the year just closed, chiefly in investigations of pellagra. The facts revealed by these studies are of an interest far beyond the limitations of the disease in question.

Two contributions of general interest have been made during the past year: One, that a dietary factor hitherto considered as homogeneous is in reality probably composed of two distinct agents, a piece of information which may elucidate some formerly puzzling data; the other, that the white rat is apparently admirably adapted to nutritional studies of pellagra. This discovery should give impetus to such studies, since these animals are relatively cheap, easily kept and handled, and can be conveniently used in greater numbers than the larger animals hitherto employed.

The field studies were, as for some years past, actively carried on under the direction of Surg. Joseph Goldberger, at the Georgia State Sanitarium, Milledgeville, Ga., and in cooperation with the Hygienic Laboratory at Washington, D. C.

At the Georgia State Sanitarium studies were conducted of the pellagra-preventive value of tomatoes, carrots, and rutabaga turnips. The results of these studies will be made the subject of a special report.

At the Hygienic Laboratory the study of experimental black tongue was carried on throughout the year, with special reference to its relation to human pellagra by testing the black-tongue preventive activity of a number of foods. The results continue to indicate that this pathological condition of the dog and human pellagra are fundamentally identical conditions.

In connection with the studies of black tongue a large number of experiments were carried out in the albino rat with results indicat-

ing that the dietary factor that prevents pellagra and black tongue—which for convenience has been designated as *factor P-P*—is, as it exists in yeast, quite thermostable and is probably identical with a factor that has heretofore been included with the antineuritic or beriberi factor, in the designation “water soluble B.” Or, in other words, that the vitamin heretofore known as water soluble B actually includes two vitamins, one the antineuritic or beriberi vitamin which, as it occurs in yeast, has been found to be relatively readily damaged or destroyed by heat, and the other the newly recognized factor P-P above referred to. In the studies in the albino rat there were included also tests of certain diets that were so constructed as to be deficient in factor P-P, but complete for growth with respect to all other at present known dietary essentials. Among the animals fed these diets a number developed a condition strikingly suggestive of pellagra and, so far as can at present be judged, is very probably the analogue of black tongue in the dog and pellagra in man. The results of the laboratory studies indicate therefore that both the dog and the albino rat are suitable experimental animals for the study of pellagra. Further studies will be required, however, to establish this beyond question.

Some of the results referred to in the foregoing have been the subject of special reports which have been published during the year.<sup>3</sup>

The office of nutrition investigations has, in addition to its research activities, replied to a large number of inquiries from the public on various nutritional problems.

#### ROCKY MOUNTAIN SPOTTED FEVER

The studies of Rocky Mountain spotted fever have been continued at the Hygienic Laboratory, under the direction of Surg. R. R. Spencer, and at the field station at Hamilton, Mont., under the direction of Special Expert R. R. Parker.

The major effort of the year has been expended in the preparation of the prophylactic vaccine which has been developed against Rocky Mountain spotted fever, in the testing of its value by administration in selected areas, and in the checking of results. Its probable effectiveness as a preventive agent had been indicated by the results of a preliminary test made in 1925 in a group of persons exposed to constant and unusual danger of infection. Two men who had received but one-fourth the dosage considered likely to give full protection later contracted mild infections and recovered. These recoveries were the only two among seven Bitterroot Valley cases during the season of 1925, and also the first two records of recovery among laboratory and control workers.

Although somewhat curtailed because of the importance of the vaccine work, other lines of the Rocky Mountain spotted-fever investigations have been continued, as follows: Field investigations relating to the means of maintenance and perpetuation of Rocky Mountain spotted fever in nature; epidemiological studies relating particularly to distribution and prevalence; laboratory studies of the

<sup>3</sup> Reprints Nos. 1062 and 1083 from the Public Health Reports for Feb. 19, 1926, and May 28, 1926.

tick and blood virus of Rocky Mountain spotted fever; and further studies on tick paralysis.

*Preparation of vaccine.*—The production of the vaccine, which is made from infected adult ticks, requires nearly a full year. It involves the engorging of hundreds of female ticks, the feeding of hundreds of thousands of the resultant larvæ on infected hosts, and the rearing of these through the nymphal stage to adults. It is in the adult ticks that the highly virulent virus essential for a potent vaccine most consistently occurs. The degree of virulence, however, varies markedly in the progeny of different parent females, and for this reason it is necessary that the progeny of each female be reared to adults and later made into vaccine as distinct units. This greatly increases the labor involved. The rearing and infecting of the ticks and the making the vaccine in bulk has been done at Hamilton, Mont. It was then forwarded to the Hygienic Laboratory, where each lot was tested for sterility and potency, freed of tick tissue, and the completed product put in ampules ready for use.

*Tests to determine effectiveness of vaccine.*—Tests of the vaccine during 1926 were planned on as large a scale as commensurate with the available vaccine. To this end, two areas were selected—one including territory tributary to Shoshone, in the Snake River Valley of southern Idaho, the other the Bitterroot Valley of western Montana. These areas were selected with the object of determining (a) whether the vaccine were sufficiently potent to confer full immunity, or (b) if full protection were not given, to what extent the vaccine modified infection.

The Shoshone area was selected not only because of the considerable number of cases that occur each year but also because so high a percentage of them occur among men engaged in handling sheep on the range, thus making it feasible to limit the test to a relatively small group of men in one industry. The number of nonimmunes so employed was about 300. Of this number 123, or approximately 40 per cent, were vaccinated. The remaining 60 per cent served as controls. An absence of cases among the vaccinated group and a considerable incidence in the unvaccinated group would be strong evidence that vaccination had resulted in full immunity. If cases occurred in both groups, however, the test would mean little, since the marked variations in the severity of individual cases of the disease in this area would prevent definite conclusions as to partial protective value. This test was made with the cooperation of the Idaho Department of Public Welfare and the Idaho State Board of Sheep Commissioners.

In the Bitterroot Valley, cases, while not numerous, are almost uniformly fatal. In this area, which is much smaller and has no outstanding type of agriculture in which cases predominate, it was planned to vaccinate the largest number of persons possible. Because of relatively low incidence, an absence of cases in the vaccinated group, except as continuing over a series of years, would be only of suggestive value. If, on the other hand, several cases occurred in this group and uniformly recovered, it would indicate that the vaccine conferred partial protection. If such cases, however, were fatal, vaccination would appear to be without value. A total of 620 vaccinations were made.



*Results of tests.*—No cases of spotted fever have occurred in vaccinated persons in either the Shoshone or the Bitterroot Valley areas. In the former there have been 8 cases in the nonimmune control group of persons engaged in the sheep industry and 16 additional cases have occurred outside the control group. In the Bitterroot area there have been four cases, all of them fatal.

These results are very suggestive of the value of vaccination and indicate that full immunity is conferred. The evidence, however, is less decisive than hoped for because of the unusually low incidence of cases, especially in the Shoshone area. It will be necessary to have a much larger volume of field data before any conclusion is reached.

As a result of the tests made in 1925 and 1926 a very pronounced belief in the value of the vaccine is prevalent among the local physicians and residents of both test areas. It has been impossible to meet the demand for vaccine, both from within and without these areas. Persistent requests from Wyoming, due to increased incidence and mortality rate, have had to be refused. Indications point to a 1927 demand that will be greatly in excess of any supply that can possibly be prepared with present facilities.

*Field investigations.*—Pertinent data relative to the factors concerned in the maintenance of spotted-fever infection in the Bitterroot region have been secured. These data indicate that the further prosecution of this phase of the investigation work, which has in view the application of findings to control methods, should proceed along two main lines: First, the securing of more comprehensive knowledge of the habits and the relative importance as wood tick (*Dermacentor andersoni*) hosts of the various mammals which inhabit the Bitterroot Mountains; second, to determine the exact part which the rabbit tick (*Haemaphysalis leporis-palustris*) plays in the natural maintenance of infection. The first line of study is essential, because it has been demonstrated that the primary conditions responsible for the perpetuation of infection are resident in the west side mountains, and that any control procedure that aims at more than partial and temporary relief of valley conditions must include some plan for preventing or materially decreasing the annual outflow of infection from mountains to valley. The second is essential because the degree of thoroughness of wood-tick control necessary to eliminate valley infection or to reduce it to an irreducible minimum, and the nature and comprehensiveness of the measures which must ultimately be adopted to give permanence to the results secured, will hinge upon whether or not the rabbit tick can maintain infection independently of infection in the wood tick.

*Studies of tick and blood virus.*—Studies of tick virus have demonstrated that the virus is inseparable from the red and white blood cells by laboratory methods but that the excrement of infected ticks is sometimes infectious. Infection has been recovered only from the intestinal excreta and not from the waste passed from the Malpighian tubules. Tick excreta heretofore has not been considered a source of danger. These results, however, indicate the possibility that human infection can be acquired through tick excrement, although infection as thus transmitted to laboratory animals seems less virulent than when conveyed by the tick bite. Studies have also shown that the demonstration of Rickettsia in ticks is not conclusive proof of the infectiousness of such ticks.

*Epidemiological studies relating to distribution and incidence.*— Since this station was established in 1921, data have been accumulated which show an intensive and extensive spread and an increasing incidence of Rocky Mountain spotted fever throughout a large part of the infected areas in the Northwest, especially in the States of Wyoming, Oregon, Montana, and parts of Idaho. North Dakota has been added to the list of States in which the infection is endemic. Reports from many localities are suggestive of increasing virulence and a corresponding increase in mortality. This infection is certainly a factor of growing importance in the economic life of many sections of the Northwest.

Incidental to the spotted-fever investigations, evidence was secured by this laboratory in Montana, Idaho, and Wyoming, that indicates that the wood tick (*Dermacentor andersoni*) is the most important single factor in the causation of human infection with tularaemia in the Rocky Mountain States. The investigations of tularaemia conducted at the Hygienic Laboratory are referred to on page 61.

#### ADMINISTRATIVE HEALTH PRACTICE

An office of administrative health practice was established during September, 1923, for the purpose of cooperating with the committee on administrative practice of the American Public Health Association in a resurvey of municipal health service in the larger cities in the United States. During the present year the resources of this office have been directed chiefly to the preparation, editing, and final review of a comprehensive report covering the principal health activities in the 100 largest cities which were surveyed by service officers during 1924. The publication of this report has been delayed in order to allow the various authors sufficient time in which to complete their manuscripts and revise their data so that the individual chapters might present a coordinated review of present-day public-health practice. At the close of the fiscal year the report is practically completed and ready for publication.

As a result of contacts established during the recent survey, many requests were received from municipal health authorities and others for detailed information concerning current practice or special data in respect to certain activities. In attempting to supply this information from the material already collected, the inadequacy of detailed records of existing practice even in the well-defined fields of public-health activities was clearly emphasized. The absence of universal standards and clear-cut definitions and the continued application of many methods and procedures that are inconsistent with our present knowledge concerning the cause and prevention of disease constitute some of the obvious defects in the administrative programs now in force.

Further progress in public-health work will depend largely upon the gradual development of new principles and the reconstruction of many of the standards or practices that are now generally accepted. It is reasonable to expect that further experience and trial will bring about continued improvement in the technique of administration and in the machinery and equipment needed to promote our public-health interests.

During the present fiscal year the office of administrative health practice was moved to new and more commodious quarters provided by the Johns Hopkins School of Hygiene and Public Health in Baltimore.

Incidental to other work of this office, a survey of the health activities of Alexandria, Va., was undertaken at the request of the municipal authorities, who were desirous of reorganizing the health department.

#### CHILD HYGIENE

Field investigations in child hygiene were carried on under the direction of Senior Surg. Taliaferro Clark until he was relieved from duty on January 20, 1926. His successor, Surg. Grover A. Kempf, assumed charge of the work on March 29, 1926. The investigations undertaken included research in special problems of child health and studies in child-health administration.

#### MENTAL AND PHYSICAL STATUS OF NEGRO CHILDREN

A request received by the service for information concerning negro children led to a realization of the fact that very little reliable data on this subject were available. As a means of supplying this definite need, the service undertook a study of the physical and mental status of negro children in the city of Atlanta, Ga. This work was carried on in cooperation with the Georgia State Board of Health and the Atlanta Board of Education.

Beginning in September, 1925, and continuing throughout the school year, a large amount of data has been accumulated. Thirteen schools were visited and 5,168 children, between the ages of 6 and 14 years, were given physical examinations. In addition, careful measurements were taken and much valuable anthropometric data collected.

In five of the Atlanta colored schools it was possible to conduct psychological examinations in addition to the physical examinations and measurements, and the results of 2,893 group tests and 606 individual tests were secured. In the group testing, the Otis advanced examination was used for the fifth and sixth grades, and the Otis primary examination for all grades below the fifth. In the individual examinations use was made of the Sanford-Binet test, supplemented when desirable by the Lincoln hollow square, Healy construction A, and Kohs's block design tests.

The psychological material is already in process of analysis and a report on the subject will be made shortly.

The physical and anthropometric data are so extensive that more time must elapse before the results of this part of the investigation can be adequately presented.

#### COOPERATION WITH THE GIRL SCOUT ORGANIZATION

On the request of the director of the Girl Scouts of the District of Columbia, the child hygiene office continued the physical examination of girls who registered for attendance at the Girl Scouts' camp. At the close of the year 119 examinations had been made.

## GROWTH AND DEVELOPMENT OF SCHOOL CHILDREN

The present fiscal year marked the completion of five years of child hygiene investigations in Hagerstown, Md. This study of the physical status, growth, and development of a gradually widening group of elementary school children is assuming important proportions. The year's work included studies in health supervision of school children over a protracted period, studies in oral hygiene, and studies in physical development.

*Physical examinations.*—During the school year 3,625 children were given complete physical examination. Of this number, 2,851 were children who were first examined in 1921–1925.

The physical examinations for this year revealed the fact that there was a slight increase of the total amount of visual defect among the older children, the new entrants having 25.58 per cent of more or less visual defect while the older group had 29.71 per cent. The same slight increase is seen in serious defects of vision, 9.17 per cent of the new entrants having serious defects as compared to 11.54 per cent in the older children.

Of the total number of children examined, only 20, or 0.55 per cent, were found who had never been vaccinated, and 14 of those were new entrants.

*Oral hygiene.*—An examination of the mouth, with numeral rating, was given to each of the 3,625 children examined. The following defects with percentage of each in the number examined were noted:

	Per cent having defect
Carious temporary teeth.....	72.06
Carious permanent teeth.....	72.66
Missing permanent teeth.....	12.33
Gingivitis.....	12.41
Fistulae (gingival).....	5.82

It was found that the percentage of gingivitis among the new entrants was more than four times that among the older children, 62.01 per cent of the new entrants being affected and only 14.1 per cent of those who had had from one to four years of health supervision in the schools.

*Physical development.*—The study in physical development consisted of a series of measurements on a group of approximately 3,400 children. This was a continuation of the special study of physical development as expressed in increments of weight and height. Weights were taken at intervals of one month, one standing and two sitting heights (methods of Dreyer and Hrdlicka) at approximately six-month intervals. A total of 20,557 height measurements (standing and sitting) were secured during the school year.

An investigation of the consistency of the two sitting heights (methods of Dreyer and Hrdlicka) was undertaken with a selected group of 200 children. Trunk measurements of each child were taken ten times by each of the two methods.



Following are the percentages of variation for boys and girls per 1,000 measurements:

	Dreyer	Hrdlicka
Girls.....	17.2	5.5
Boys.....	14.8	7.2
Total.....	32.0	12.7

A detailed report of this study will be made later.

In addition to the above studies, a series of special chest measurements was made with a vernier caliper upon the entire group of children receiving physical examination.

#### STUDIES IN NATURAL ILLUMINATION OF CLASSROOMS

The studies in illumination were continued throughout the year, and consisted of (1) observations of natural illumination of classrooms in Washington, D. C., and (2) analysis of the data obtained through the illumination studies made in Hagerstown, Md., the preceding year.

Hourly observations of natural illumination were made on selected desks in five school buildings in Washington, D. C., one building being used on each school day of the week. Each hourly series of inside measurements was preceded and followed by an outside determination of the brightness of the sky; and the measurements for the desks in each room were followed by a determination of the illumination at the windows and normal to the glass.

The buildings selected for this study were among those in which the eyes of the pupils had been examined by the service investigators during the preceding school year. The purpose of the study has been twofold: (1) To determine any correlation which may exist between the relatively poor illumination observed for some of the buildings and the poor vision previously noted, and (2) to study the illumination obtained with the types of architecture and environment of the five buildings studied.

Satisfactory progress was made in the analysis of the data obtained at Hagerstown, Md. The first report of this study was issued in January, 1926.<sup>4</sup> This bulletin was written from the standpoint of the average school commissioner or county official and only general averages of the observations were given. Among the conclusions reached are the following:

1. The inside illumination, apparently, is influenced more by the sky brightness than by the outside illumination.
2. From the desks in the row farthest from the windows the illumination was below the accepted standard of 5 foot-candles much too frequently to be ignored.
3. Artificial lighting should be provided, at least for the half of the rooms farthest from the windows. The lighting circuit should be divided so that only the dark half of the room may be lighted when necessary.
4. The width of the rooms for unilateral lighting should not be much in excess of 20 feet, at least in the locality studied.

<sup>4</sup> Public Health Bulletin No. 159.

5. For a room about 20 feet wide the glass-area floor-area ratio should not be much less than 20 per cent.

6. The windows should extend as near to the ceiling as possible, assuming a ceiling height of 12 to 14 feet.

7. The windows should extend as near to the rear wall of the room as possible, especially on the west side of the building.

8. The "reduced square degree" is a better measure for the sky vault which may be visible at a desk than merely the square degree.

9. The rule that every desk should have visible at least 20 "reduced square degrees" of sky vault is apparently a very good one.

10. Near-by trees, particularly large, tall ones, reduce the visible sky vault so materially as to suggest, from the standpoint of lighting alone, that all trees should be eliminated from plats of ground used for school instruction or study purposes. However, in order to meet the demand for the beauty and shade provided by trees, it would seem advisable to recommend that trees should never be planted closer than 50 feet from the school building, and then only provided they are kept topped and trimmed, so that their maximum height shall not exceed half the distance to the building.

11. The distribution of light over the rooms is better on the side of the building opposite the sun than on the same side as the sun.

A further careful scientific analysis of the data is being made and will be presented in a later report. It appears that the "inside-outside" illumination ratio is not constant as was believed by some investigators, but has at least three definite laws of change. When this analysis has been completed it is believed that it will prove to be fundamental for the future development of the subject.

#### VISION OF SCHOOL CHILDREN

The studies of the vision of school children, begun during the preceding year, were continued in cooperation with the departments of health and education of the District of Columbia. During the summer session in 1925 and the regular session of 1925-26, a total of 1,149 children were examined in 12 schools. Visual acuity was tested before and after the use of a cycloplegic, and refractive errors were carefully rated.

The results of the examination after use of the cycloplegic are shown in the following table:

Type	Regular school		Summer school	
	Number	Per cent	Number	Per cent
Normal or emmetropic.....	37	3.69	1	0.68
Hyperopic .....	693	69.1	106	72.00
Myopic .....	47	4.68	8	5.4
Simple hyperopic astigmatism.....	22	2.19	2	1.3
Simple myopic astigmatism.....	5	.49	1	.68
Compound hyperopic astigmatism.....	171	17.00	24	16.3
Compound myopic astigmatism.....	8	.79	0	0
Mixed astigmatism.....	19	1.89	5	3.4
Total.....	1,002	-----	147	-----

There is a marked difference in the percentage of normal vision found before and after the use of a cycloplegic.

	Regular school	Summer school
Before cycloplegic.....	<i>Per cent</i> 63.47	<i>Per cent</i> 60.54
After cycloplegic.....	3.69	.68

Many children with 20/20 visual acuity before the use of the cycloplegic have only 20/200 or 20/100 after its use. The ultimate result of such cases of eye strain is an important problem.

It is interesting to note that the percentage of mixed astigmatism in the summer school is decidedly greater than that in the regular school—3.4 per cent in the former and 1.89 in the latter. On the other hand, the percentage of normal vision is decidedly less in the summer school. Since the summer school is attended largely by retarded children, it is possible that there may be a definite relation between their retardation and poorer eyesight.

#### DENTAL HYGIENE IN SCHOOL CHILDREN

The health officer of a county in the State of New Mexico was of the opinion that the children of Spanish extraction of his county had better teeth than the children of other sections of the United States. A medical officer was assigned to this county to make a special investigation to determine whether or not these children had better teeth and also, if possible, why. A group of approximately 500 urban children and the same number of rural children were given a physical examination, particular attention being paid to the teeth.

With the exception of the dental condition, the general physical condition was inferior to the children examined in other parts of the country. Taking the first permanent molar as an indicator, the children of this county were found to have better teeth than the children formerly examined in New York, Delaware, Virginia, West Virginia, and Florida.

#### *Defective or missing 6-year molars*

Age	1 or more		2 or more	
	East	West	East	West
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
All ages.....	50	13	33	8
Under 8.....	29	3	18	3
9 to 12.....	53	12	38	8
13 and over.....	53	28	37	13

The use of the toothbrush is practically unknown in the rural sections of the county. There is no dental hygiene practiced, and only six children had ever visited a dentist. The diet is simple and natural and undoubtedly has an important bearing on dental conditions.

## INDUSTRIAL HYGIENE AND SANITATION

The activities of the office of industrial hygiene and sanitation were carried on under the direction of Surg. L. R. Thompson. They included (1) investigations of tetraethyl lead; (2) studies of occupational health hazards; (3) studies of occupational diseases; (4) studies of the causes of industrial absenteeism; (5) statistical studies; (6) cooperation with Government departments; (7) cooperation with industrial and other agencies.

## INVESTIGATIONS OF TETRAETHYL LEAD

The field studies of tetraethyl lead have been conducted under the direction of Surg. J. P. Leake. The committee, consisting of Dr. W. H. Howell, chairman, Dr. A. J. Chesley, Dr. David L. Edsall, Dr. Reid Hunt, Dr. W. S. Leathers, Dr. Julius Stieglitz, and Dr. C.-E. A. Winslow, which was appointed by the Surgeon General to determine "the health hazards involved in the retail distribution and use of tetraethyl lead gasoline motor fuel," presented a report on January 17, 1926, before a public conference. The report of the committee was based upon the study made by Doctor Leake, assisted by a number of the staff of the Hygienic Laboratory and of the section of industrial hygiene and sanitation.

Two hundred and fifty-two individuals were studied, all adult males. They were divided into five groups: Group A (negative-control group)—drivers of automobiles in which the gasoline used contained no lead; Group B (test group)—duties similar to those of Group A, drivers of automobiles using ethyl gasoline which contained lead; Group C (negative-control group)—representing garage workers, gasoline fillers, etc., working in garages and service stations where the gasoline did not contain lead; Group D (test group)—similar to Group C, except that ethyl gasoline was handled in the garages or stations; Group E (positive-control group)—employees in industrial plants in which there was a serious exposure to lead other than tetraethyl lead. Each individual was subjected to a careful clinical examination, and in addition, smears were made from his blood and a specimen of feces was collected. The blood smears were examined for stippling of the red cells, and the feces for the presence of lead, methods of great accuracy, which were especially devised for this study, being used.

The results of these studies brought out the following facts: The results in Groups A and B were practically identical. Lead was found in the stools of members of both groups; and in this connection, 20 examinations which were made in Washington, of 10 workers in the Hygienic Laboratory who had no known exposure to lead, also showed small quantities of lead ranging from 0.047 milligram to 0.29 milligram per gram of ash of feces. Group C, representing garage workers and handlers of gasoline with no lead, showed an indication of slightly greater excretion of lead. Group D, similar to Group C, but using ethyl gasoline, showed still further increase of the amount of lead excreted. The committee believed that at least part of this increase might have been due to the use of ethyl gasoline. Group E, which was known to be exposed to a definite lead



hazard, showed that over 80 per cent had more than 0.3 milligram of lead for each gram of ash of feces, and in some cases the lead was present in concentrations as great as 3 milligrams per gram of ash.

The study of the stippled cells found in the blood of the workers in these various groups gave a picture similar to that of the excretion of lead in the feces.

The committee concluded—

(1) That drivers of cars using ethyl gasoline as fuel in which the concentration of tetraethyl lead was not greater than 1 part to 1,300 parts per volume of gasoline showed no definite signs of lead absorption after exposure of approximately two years.

(2) That employees of garages and service stations may show evidence of lead absorption and storage; and that in garages and service stations where ethyl gasoline is used the amount of apparent absorption and storage was increased, but that the effect was slight as compared with that in Group E, and that for the periods of exposure studied this was not sufficient to cause detectable symptoms of lead poisoning.

An interesting and important fact brought out in this study was the finding of considerable amounts of lead (0.08 to 2.23 per cent) in the dust of garages whether the gasoline used contained lead or not. Carbon monoxide was also found in dangerous quantities in the air of the garages during those periods of time when the cars were being moved.

As the result of the committee's recommendations, a series of regulations covering the control of the manufacture and blending of tetraethyl lead and ethyl fluid, the mixing of ethyl fluid and gasoline, and the distribution and sale of ethyl gasoline was prepared by the Public Health Service and submitted to the various State health officers for their criticism and recommendations with a view to assisting the States in obtaining uniform regulations. These suggested regulations regarding the manufacture, blending, and mixing of tetraethyl lead and ethyl fluid are being followed by the manufacturers and distributors.

#### SURVEYS OF OCCUPATIONAL HEALTH HAZARDS

*Ventilation studies.*—These studies have been continued under the supervision of Associate Sanitary Engineer Leonard Greenburg. Laboratory studies have progressed in determining the electrical charges and buffering capacity of various industrial dusts, with the idea that a knowledge of these properties of dust may give a better understanding of the mechanism by which dusts may cause injuries to lung tissue.

As a result of a paper presented before the American Public Health Association on the subject of window and fan ventilation, a study of schoolroom ventilation has been undertaken at Rochester, N. Y., by the committee on heating and ventilation of the American Public Health Association in cooperation with the United States Public Health Service. To a certain extent the principles evolved for this study should be applicable to factory ventilation.

In cooperation with the National Safety Council studies regarding the use of certain solvents in industry have been carried on over the

past two years. These studies have disclosed the facts that the use of benzol is associated with a specific type of anemia; that there exists considerably more of this type of poisoning than has hitherto been known to exist; and that benzol poisoning presents a very specific type of blood picture which now readily leads to the identification of poisoning in association with a definite occupational exposure to benzol. The survey brought out evidence that in the atmospheres of American industrial plants with excellent systems of exhaust ventilation there could still remain a quantity of benzol vapor equal to about 100 parts per 1,000,000 of air, and that in this proportion benzol vapor in air is capable of producing industrial poisoning. At the other extreme it was found that in plants without any kind of ventilation whatsoever the quantity of benzol vapor could exceed 4,000 parts per 1,000,000 of air.

In connection with the use of certain solvents in industry, the Service has also been cooperating with the National Safety Council in the study of spray painting, and with the Department of Labor and Industry of the State of Pennsylvania in the formulation of regulations for the control of spray painting in that State.

*Dust studies.*—Under the direction of Asst. Surg. A. E. Russell, the series of dust studies which have been carried on by the Service for the past three years has been continued. The surveys relating to cement dust, granite dust, hard-coal dust, and silver polishing have been completed. There still remain three groups under observation in connection with the studies—soft coal, vegetable, and municipal dusts.

The study of silica dust includes the observation on approximately 1,000 workers in 14 granite manufacturing plants. Physical examinations have been made of 520 of these workers, with X-ray examinations of approximately 200. Of special interest is the fact that six autopsies have been obtained, four of which have shown pneumoconiosis complicated with tuberculosis, while one showed an early case and one a moderately developed case of pneumoconiosis. These autopsies have all been studied by Consultant Leroy Gardiner and should give a good presentation of the pathology of pneumoconiosis alone and complicated with tuberculosis. Among the employees studied there have been 22 deaths from pneumoconiosis complicated with tuberculosis, and there are at present 20 ill with this disease.

The hard-coal-dust study covers a group of 740 miners. About 70 X-rays and 425 physical examinations have been made of these cases. In addition, about 30 men who have retired from the mines because of ill health have been examined. A canvass of the miners' families was also made with a view to determining the sanitary conditions of their homes and the amount of respiratory diseases prevalent among the members of the family, particularly with reference to tuberculosis and asthma.

The study of physical and chemical characteristics of the dusts has been made by Asst. Physical Chemist J. J. Bloomfield, under the direction of the medical officer in charge. In the granite industry a total of 220 dust observations were made in 14 sheds, divided so that an equal number was made in the summer and winter seasons. As the result of these observations it was found that approximately 94

per cent of the men in the group investigated were exposed to an amount of dust from 6 to 600 per cent in excess of the standard advocated by the South African investigators. In a general way the death rate from tuberculosis in the various occupational groups in the granite industry varied directly as the exposure to the amount of dust increased, as determined by the number of particles per cubic foot of air.

Forty observations were made as to the atmospheric dustiness in soft-coal mines. This preliminary report showed that of the 210 men under observation about 49 per cent were exposed to exceedingly large quantities of dust, of over 60,000,000 particles per cubic foot of air. This count reached as high as 257,000,000 particles per cubic foot among the occupational group classed as coal cutters.

In the preliminary observations of vegetable dust made at Greenville, S. C., in addition to observations on the amounts and character of the dust, daily records are being kept as to the wet and dry bulb temperature and kata thermometer readings.

The cement-dust study, which is ready for publication, brings out several very interesting observations. Among the employees working in this dust the highest respiratory incidence rate occurred among those who quit the industry and did not return. The next highest was among those who quit and came back, while the lowest respiratory rate was recorded for those who did not quit. The respiratory rate for these employees was much above the rate for any other industry studied in which dust was not a hazard.

*Studies in illumination.*—Under the direction of Physicist James E. Ives, studies of the effect of illumination on eyesight and production have been continued. The most important of these observations have been carried on at the Chicago post office, where approximately 30 letter separators have been under observation for the past two years, working under degrees of illumination which have been varied from approximately 2 to 25 foot-candles. In this study an attempt has been made not only to determine the effect of illumination on production but also to discover whether changes in illumination have any effect on speed of vision, acuity of vision, and fatigue of the eye. An attempt has been made to express mathematically the rate of increase in production under low degrees of illumination, from 0 to 3 foot-candles.

The readings of daylight taken by the Case photoelectric cell have now been completed for a period of over one year and are being compiled as representative of the actual amount of daylight for this latitude in the United States, and to be used for study as to the relationship between daylight and health. In addition, observations have been made as to the best method of measuring and recording ultra-violet radiation, with the idea of determining the actual ratio between ultra-violet radiation and daylight.

#### STUDIES OF OCCUPATIONAL DISEASES

*Posture in industry.*—As the result of the preliminary analysis of the data obtained on posture it was thought that muscular tone might be a considerable factor in determining posture. To test out this idea two similar groups of high-school boys at the George Washington

High School, New York City, were employed; one group was given special physical training to increase muscular tone, while the second was excused from all gymnasium work and was requested to take as little exercise as possible during the period of observation. Complete physical examinations were made at the beginning and end of the study and photographs were made at the same time. Additional measurements were also made, including strength tests of push, pull, and lift; lung capacity and lung fatigue; and measurements of the lumbar and cervical curves of the spine. As would be expected, the boys taking physical exercise showed a general improvement in their physical condition over the control group. Whether or not any change in posture took place as the result of these exercises has not yet been determined. These studies were made under the supervision of Surg. Louis Schwartz.

*Occupational dermatosis.*—A tentative plan for the study of occupational dermatosis during the coming year has been made, and a list of all known cases has been compiled for early publication in Public Health Reports.

#### STUDIES OF CAUSES OF INDUSTRIAL ABSENTEEISM

The investigations of industrial morbidity have been continued in cooperation with the office of statistical investigations under the supervision of Statistical Expert Dean K. Brundage. The data for study and analysis have been obtained from three different sources:

(a) Records of 35 sick-benefit associations with a combined membership of approximately 135,000 industrial employees.

(b) Records of medical departments of several large industrial establishments.

(c) Records collected by the office of industrial hygiene and sanitation in connection with specific studies.

The analysis of the data collected has enabled us to have a better understanding of the average frequency of attacks of disabling sickness and the average duration of such attacks at different ages among males and females, the effect upon the sickness rate of specific physical defects, racial susceptibility or predisposition to certain diseases, and the influence of marital status. The amount of disabling sickness in excess of the expected rate after adjustment of the influence of the more important factors, except occupation, affords, it is believed, a fairly satisfactory measurement of the effect of occupation or the specific industrial-health hazard under investigation. Another matter of special interest to industry has been the development of a scientific method for evaluating the effect of industrial medical services upon the frequency and duration of sickness of industrial employees having access to such services.

The five-year study of disability among 133,000 industrial employees absent on account of sickness for eight consecutive days or longer has indicated the importance of the respiratory group of diseases in causing loss of time from work. Influenza and grippe accounted for 18 per cent of all sickness claims, and from the standpoint of interrupted production and wages lost no other disease has been so important in recent years. In the five years ending December 31, 1924, influenza and grippe disabled industrial employees at a rate which was six and six-tenths times the frequency of the epi-



demic, endemic, and infectious diseases against which public-health work is so largely directed. Although pneumonia (all forms) occurred at only one-sixth of the rate of influenza, it appears to constitute a problem of some seriousness in the iron and steel industry, where the frequency of pneumonia was practically twice as great as in the other industries from which reports were received.

Sickness rates, even when three-year averages have been used, show a wide variation according to industrial establishments. Of the plants reporting to the Public Health Service, the plant with the highest sickness rate had nearly 350 per cent more sickness than the plant which recorded the lowest rate. The reasons for this tremendously wide difference are, of course, of vital importance to industry, and from our analysis part of the explanation would appear to lie in the type of the individual, from a physical standpoint, who is attracted to the industry or establishment by the nature of the work. In many industries and in different factories in the same industry a selective process of this sort seems to be continually going on. It must have an important effect on the sickness rates for the industries.

#### STATISTICAL STUDIES

The preparation and analysis of industrial hygiene problems recorded elsewhere have been carried on in cooperation with the statistical office under the direction of Associate Statistician Rollo H. Britten.

A study of the physical condition of 10,000 male industrial workers, referred to in the last annual report, was published during the year.<sup>5</sup>

The most important study of the year has been the analysis of the posture data collected by Surg. Louis Schwartz. This survey includes 2,200 boys and men from 3 to 60 years of age. The primary point of the investigation, as set forth in the last annual report, was to determine whether there is a standard posture, deviations from which in industry could be regarded as showing the effect of occupation. The preliminary analysis of these data seems to indicate that it is impossible to describe any standard posture which is possible of attainment for all types of individuals. The basis for this statement will be the topic for a final paper in connection with the analysis of the posture data. It is expected to prepare a series of papers on the following points related to body development:

(a) The factor of build in physical examinations. A satisfactory classification of build involves not only height and weight but also the amount of fat or stockiness.

(b) Body growth with age, with consideration of adequate physical measurements of males of all ages, relating to height, weight, chest diameters, chest circumference, abdominal circumference, etc.

(c) Studies of measurement of physical fitness among males. In addition to the physical measurements the examination includes determination of the vital capacity, blood pressure, pulse rate, chest expansion, lung fatigue, etc.

(d) A study of the relationship of various parts of the body to other parts, as, for example, the lumbar spinal curve to abdominal protrusion, etc.

---

<sup>5</sup> Public Health Bulletin No. 162.

(e) Strength tests and growth. Relationship between the strength tests which were used in the study and health, physical fitness, and body measurements.

(f) Pubescence in relation to build and body measurements.

(g) Flat-footedness among men and boys.

(h) Age curves of the defects and diseases among men and boys.

(i) Lateral deviations of the spine among males, which, in addition to the character and extent of the lateral deviation, may be correlated with right and left handedness and weight bearing on the right or left foot.

#### COOPERATION WITH OTHER GOVERNMENT DEPARTMENTS

*Post Office Department.*—Cooperation has been continued with the Post Office Department in a further test to determine the most efficient system of lighting in post offices.

*Bureau of Standards.*—The study of occupational hazards among the employees of the Bureau of Standards was continued.

*Bureau of Mines.*—Studies of mine sanitation were carried on during the fiscal year 1925-26 with the Bureau of Mines, Department of Commerce, the medical personnel being detailed from the Public Health Service to that bureau for the purpose. Surg. R. R. Sayers was in charge as chief surgeon of the Bureau of Mines.

The investigation of the physiological effects of abnormal atmospheric conditions was continued by the Bureau of Mines in cooperation with the American Society of Heating and Ventilating Engineers. Some of the results of investigations conducted in atmospheres of low temperatures with still and with moving air were published by Dr. W. J. McConnell and C. P. Yagloglou in the *Journal of the American Society of Heating and Ventilating Engineers*, for May, 1926, under the title "Work tests conducted in atmospheres of low temperatures and various humidities in still and moving air." A summary of the low-temperature study was prepared by Surgeon Sayers for the International Critical Tables for 1926:

At rest in still air with a temperature of 65° to 70° and with 100 per cent relative humidity, subjects stripped to the waist felt slightly cool or comfortable; under these same conditions with moderately hard work they felt comfortable. At rest in still air with temperatures from 55° to 60°, 100 per cent relative humidity, clothing was required for comfort, while at moderately hard work under these conditions the subjects were comfortable to cool stripped to the waist, and at 45° to 50° subjects working moderately hard felt cool stripped to the waist.

Another paper on this subject was published in the *Journal of the American Society of Heating and Ventilating Engineers*, for June, 1926, by F. C. Houghten, W. W. Teague, and W. E. Miller, under the title, "Effective Temperature for Persons Lightly Clothed and Working in Still Air." A general summary of the literature on the physiological effects of abnormal temperatures and humidities has been completed by Doctor Sayers.

Sanitary surveys of mining camps have been conducted during the year, and in April, 1926, a report was made on the sanitary conditions of mining camps in the State of Alabama.<sup>6</sup>

<sup>6</sup> Reports of Investigations, Serial No. 2746, Bureau of Mines.

As referred to in the last annual report, the study of lead poisoning (mining lead carbonate) in the mines of Utah was completed and will appear as Bureau of Mines Technical Paper No. 389. This report revealed the fact that lead poisoning is more commonly contracted in the mining of lead ores than has been thought.

The study of the causes of death among miners has been carried on for several years, and so far the data have been collected from the States of Nevada, California, Arizona, Colorado, and Wyoming. The study is partially complete for Alabama and Utah. This study has been made for the purpose of ascertaining the diseases and types of accidents most prevalent among miners.

As representative of the United States Public Health Service and the Bureau of Mines, Doctor Sayers participated in the International Conference on Oil Pollution of Navigable Rivers. Certain general restrictions regarding the discharge of oil into navigable waters were agreed upon by the conference.

Other studies carried on by the Bureau of Mines included physical examination and X-ray studies of miners; the completion of the experimental work done in connection with the study of health hazards from the use of tetraethyl lead; synthetic atmospheres in caisson operations, the results of which were published by Doctor Sayers in "The Value of Helium-Oxygen Atmosphere in Diving and Caisson Operations" in *Anesthesia and Analgesia*, the publication of the International Anesthesia Research Society for June, 1926.

A report entitled "Stream Pollution by Wastes from By-Product Coke Ovens" was published during the year.<sup>7</sup> Only part of the work outlined in this study has been completed. The work will be continued during the present year.

#### COOPERATION WITH INDUSTRIAL AND OTHER AGENCIES

After two years of effort an agreement has finally been reached as to the standard technique of prone-pressure method of resuscitation. The exact wording of the technique of the method will appear the same in all publications put out by the United States Public Health Service, the United States Army, the United States Navy, the American Red Cross, the Bureau of Mines, the Association of the Industrial Physicians and Surgeons, the National Safety Council, and certain other industrial associations and universities. The effect of such standardization in the technique of the prone-pressure method of resuscitation should be far-reaching and beneficial, especially in those industries where gas poisoning, electrical shock, or the danger of drowning forms an important problem.

#### MENTAL HEALTH

During the fiscal year 1925-26 the office of field investigations of mental health was occupied in gathering data relative to an epidemiological study of mental diseases occurring during the calendar years 1920 and 1925 in the city of Boston. This work was begun in the fall of the preceding year.

---

<sup>7</sup> Reprint No. 1042 from the Public Health Reports, Sept. 26, 1925.

The purpose of this study is to throw light, if possible, upon the reasons for the high proportion of foreign-born persons admitted to our public institutions for the insane and to ascertain whether or not this preponderance is due to the actual existence of a greater amount of insanity among foreign-born peoples or to a difference in the utilization of public institutions by foreign-born and native-born persons. It may be that the foreign born are more prone to accept the services of public institutions without utilizing community sources of advice and treatment, while the native born exhaust the facilities of the community before resorting to such institutions. It is evident that if such a situation exists it may well account for the presence of a larger number of foreign than native-born persons in State institutions. This is an exceedingly important question from the standpoint of immigration and the effectiveness of our immigration laws and will eventually be the means of contributing some important results to the understanding of mental diseases among our foreign-born population.

It is also hoped that this study will contribute to a better understanding of the conditions under which mental disorders occur in urban populations and of the factors which are instrumental in causing persons to seek relief from the public treasury.

During the course of this study visits were made to the various public and private hospitals for the insane in Massachusetts and records of individual cases that had been admitted from the city of Boston were read and abstracted. Upon the completion of the 1920 cases similar work was inaugurated with regard to Boston cases admitted to State institutions during the calendar year 1925.

The collection of data for this investigation, which includes approximately 3,500 cases, has now been completed and the material assembled for correlation and analysis.

In addition, this office has been concerned in establishing a literature index in which books and pamphlets bearing upon mental hygiene, psychology, neurology, psychiatry, and allied subjects are being assembled and catalogued. A complete bibliography of this literature will be of considerable practical value for future studies in mental hygiene.

#### MILK

During the fiscal year ended June 30, 1926, the milk investigations of the Public Health Service were continued under the direction of Sanitary Engineer Leslie C. Frank, with headquarters at Montgomery, Ala.

*An investigation of the possibility of unifying milk-control work in the United States.*—During the year two additional States adopted the standard milk-control program recommended by the United States Public Health Service. Ten States are now operating under the program.

By the end of the fiscal year 1924 seven cities had passed the standard milk-control ordinance. By the end of the fiscal year 1925 the number of cities having passed the ordinance had increased to 53. At the present time the number of cities having adopted the standard ordinance is 100.



*Annual surveys of the milk sanitation status of cities.*—The work of determining the milk sanitation status of cities was continued during the year, ratings being determined for 102 cities.

The data resulting from the surveys were transmitted to the various cities through the State boards of health for their information and use.

This service is intended to keep each city informed of the progress it is making in milk control and how the results attained compare with the results attained in other cities.

*Studies of the prevalence of milk-borne outbreaks of disease.*—During the year the studies of the prevalence of milk-borne outbreaks of disease were continued.

*Research work on pasteurization machinery begun.*—During the year testing work in connection with pasteurization machinery was begun at Chicago, Ill. The testing program includes the testing of all makes and types of pasteurization machinery in order to determine the thermal and time characteristics thereof. Evidence thus far secured indicates that certain of the designs of pasteurization machinery now on the market can not be depended upon to pasteurize milk properly, and the principal purpose of the work now in progress is to enable health officers to differentiate between properly designed and improperly designed machinery and also to know the conditions under which each type of machine must be operated in order to insure good results.

#### STATISTICAL OFFICE

The office of statistical investigations has been under the general direction of Statistician Edgar Sydenstricker. The investigations include work carried on in the statistical office independently as well as in collaboration with other stations of the division of scientific research and with other divisions of the service.

The organization of the office of statistical investigations is as follows:

1. A tabulating and computing unit composed of the supervising statistical clerk, several trained statistical clerks, and a number of operatives for computing, calculating, assorting, counting, and tabulating machines.

2. A small statistical staff composed of persons trained in statistical methods and in public health. These were engaged in certain statistical and epidemiological studies and in rendering assistance of a technical nature to other offices in the division of scientific research and other divisions of the service. Collaborating closely with them are the statisticians in other offices and divisions of the service.

3. An advisory staff consisting of several consultants in statistics who were called upon for advice from time to time and for special work.

About two-thirds of the time of the statistician in charge was devoted to general statistical work outside of the office of statistical investigations. Approximately 50 per cent of the time of the remainder of the personnel of the office was devoted to assisting in the statistical work of other offices and divisions of the service.

The statistical personnel of certain other offices in the scientific research division, such as industrial hygiene, child hygiene, nutri-

tion, influenza, and respiratory diseases functioned as a unit with the personnel of the statistical office, the personnel being used interchangeably on any occasion when it was deemed advisable.

#### STUDIES IN MORBIDITY STATISTICS

One of the principal pieces of work undertaken since the organization of the statistical office in 1920 has been the collection, by original field investigations as well as by cooperative effort with other agencies, of records of morbidity. It has been the aim to obtain information from all possible sources on the incidence and prevalence of sickness resulting from specific diseases among population groups of different sexes, ages, occupations, economic, and social conditions, etc. During this six-year period a large amount of material has been obtained, constituting probably the largest collection of morbidity data in the United States and, of its kind, in the world. Some of the results have been published in fragmentary reports from time to time, covering special population groups. Thus, in collaboration with the office of child hygiene certain morbidity studies of school children have been published, and in collaboration with the office of industrial hygiene and sanitation a number of reports on sickness among industrial workers have been published. These cover only persons of certain ages and living under certain conditions and do not afford an adequate picture of the incidence or prevalence of sickness in the general population. Accordingly an experiment was begun in 1921 of keeping under continuous observation a sufficiently large general population group, composed of persons of all ages, sexes, different economic and social conditions, etc. This study was made in Hagerstown, Md., and was continued beyond the original time set for a total period of 28 months. Using the Hagerstown study of a general population group as a basis, the work was commenced, during the past year, of putting together the results of all of these morbidity records as well as records of physical examinations of thousands of children and adults into a preliminary report which, it is hoped, will give a more nearly complete picture of the evidences of ill health among persons of different ages and sexes, as well as of the age incidence of the principal diseases and conditions, than has been possible heretofore. It is hoped that this report will be ready for presentation within the next year.

In the meantime, however, special reports of morbidity incidence and prevalence from various causes have continued to be presented currently. The series of reports on the "Frequency of Disabling Illness Among Industrial Workers," prepared under the supervision of Statistical Expert Brundage, has been continued. The results of the Hagerstown morbidity study are being issued in a series of papers under the general subtitle "Hagerstown Morbidity Studies," three such papers having been completed. One of these was a report giving the general results of the study; the second was a brief paper dealing with certain factors affecting the notification of communicable diseases, such as the extent to which cases of certain diseases actually come to the notice of physicians, the extent to which physicians report the cases they attend, and the accuracy of incidence rates based upon reported cases; the third was a report on the extent to which illness from different causes receives medical, hospital,

and home nursing care as well as service rendered by osteopaths, chiropractors, etc., in a typical small city. Other reports are in preparation.

In addition to the foregoing a field study of morbidity was begun among about 1,000 employees of a large silk manufacturing establishment in Connecticut. This establishment had been cooperating with the Public Health Service for more than two years in furnishing records of absence on account of sickness to the statistical office for tabulation and analysis. The experience of two years suggested that there were possibly significant differences in the sickness rate for respiratory diseases among certain occupations, and one of the purposes of the present study is to obtain more information on the reasons for this difference. Accordingly, records are being obtained not only of the causes of sickness which entail absence from work but also of all attacks of illness particularly of respiratory ailments, with notations in each instance as to the clinical manifestations of each respiratory attack. In addition, records are being kept of the meteorological conditions in the locality as well as of the temperature and humidity conditions in the places of work and in certain rooms, the temperature and humidity conditions being controlled in certain rooms for the purpose of comparison. This inquiry is thus not only a general morbidity study but also work undertaken in conjunction with the offices of respiratory diseases and of industrial hygiene.

In collaboration with the office of industrial hygiene and sanitation, current and other statistics of industrial morbidity are being analyzed under the supervision of Statistical Expert Brundage.

In connection with the work on morbidity, a number of requests for advice and assistance from State and city health departments have been received which related to procedure in the notification of diseases and the analysis of case reports for administrative and epidemiological purposes.

#### STATISTICAL AND EPIDEMIOLOGICAL STUDIES OF SPECIFIC DISEASES

The completion of the statistical study of scarlet fever, which was begun during the preceding year by Assistant Statistician Dorothy G. Wiehl, was delayed on account of the pressure of other work, but it will be submitted for publication during the early part of the coming fiscal year. In response to certain requests, the statistics of morbidity and mortality from diphtheria and measles were analyzed from the point of view of age, seasonal, and periodic incidence. In the instance of measles an analysis was made to supply certain information as to the probable rise and decline of its prevalence in view of the growing interest in efforts to reduce the incidence and sequelae of the disease among young children. In the case of diphtheria the purpose of the analysis was to determine as nearly as possible the probability of a rise in diphtheria prevalence within the next few years, the age incidence of the disease in the past in epidemic and nonepidemic periods and its fatality, especially in view of the desirability of measuring the effect of diphtheria immunization in the future.

The completion of the study of mortality from tuberculosis, upon which considerable work has been expended during the past two years, was also delayed on account of work of more pressing im-

portance, but the statistical part of the work is practically completed, and the results will be presented as soon as possible. During the past year the studies on tuberculosis were carried on by Assistant Statistician Mary Gover, particular emphasis being given to an inquiry into the correlation between indices of certain constitutional factors in the population of various cities, such as race, type of build, and death rate from organic diseases, and the general character of the predominant occupations, and the death rate from pulmonary tuberculosis. This study has shown that, while the death rate from pulmonary tuberculosis is correlated positively with the size of the negro population and negatively with the proportion of the population which are of recent immigration, it is also correlated negatively with certain evidences of constitutional type such as are afforded by certain physical measurements and by the incidence of organic diseases. These correlations appear even when the effect of other factors are held constant.

The statistical study of tonsillitis, which was begun last year by Associate Statistician Collins, is now practically completed and will be submitted for publication shortly. The main indications of this study are that there is a very definite curve of age incidence of tonsil enlargements, defects, and attacks of tonsillitis, which is quite distinct from that of other respiratory diseases; that while the incidence of tonsillitis follows in general the same seasonal variation as that of respiratory diseases it manifests itself at times in unusual outbreaks apparently independent of other diseases; that there is a very definite correlation between the incidence of diseased tonsils and of rheumatism and similar conditions among adults; that there is some correlation between susceptibility to respiratory attacks such as coryza and the conditions of the tonsils; that, on the average, diseased-tonsil conditions are not reflected in any considerable degree in malnutrition or marked underweight among children.

The records of morbidity from respiratory diseases which have been accumulated from various original and other sources during the past six years are being compiled into a general report on statistics of sickness from respiratory diseases. This work is being jointly done by both the statistician in charge and others of the statistical staff.

In addition to the specific studies referred to above a number of shorter pieces of work were completed during the year. Among these may be mentioned the following:

The preparation of monthly papers on the world prevalence of disease, summarizing the current issues of the Epidemiological Report of the Health Section of the League of Nations. These papers have appeared regularly in the Public Health Reports since April, 1924.

A brief study was made of the influenza epidemic during 1926, with especial reference to its chronology and geographic spread. It was shown that in the large cities of the United States, with a total population of about 30,000,000, the 1926 epidemic was responsible for about 16,000 deaths in excess of what might have been expected had the normal death rate prevailed; that the epidemic followed a somewhat different geographical course from prior large epidemics, appearing first in Western States and traveling south,



thence north and northeast, although evidences are also noted of its early appearance in Maryland and along the south Atlantic coast; that the mortality rate varied greatly in different localities both in the United States and in Europe; and that in the United States the mortality was confined chiefly to young children and persons past middle age. Attacks occurred at all ages without, however, the high incidence among adolescent and young adults which characterized the 1918 epidemic.

#### WORK IN ASSOCIATION WITH OTHER OFFICES AND DIVISIONS OF THE SERVICE

A considerable part of the work of the office of statistical investigations was the rendering of assistance to other investigations in the division of scientific research and other divisions of the service. This cooperation comprised the following: (1) Technical advice and criticism on statistical procedure; (2) assignment of statistical personnel to assist other statistical units; (3) use of mechanical equipment and operators.

The major part of this work has been with the following offices and divisions:

1. In the division of scientific research, with field investigations of child hygiene, of industrial hygiene and sanitation, of nutrition (on pellagra), diphtheria, interepidemic influenza and minor respiratory diseases, goiter, trachoma, and with the Hygienic Laboratory.

2. In the division of venereal diseases the statistical compilations of current reports on venereal diseases from State health departments and clinics have been carried on under the supervision of the office of statistical investigations.

3. The office of statistical investigations collaborated with the division of sanitary reports and statistics and the hospital division on a number of routine matters.

The detailed reports on the statistical phases of the work of other units and divisions with which this office collaborated are included in their several reports.

#### COOPERATION WITH OTHER AGENCIES

In addition to answering routine requests for statistical information, cooperation with agencies outside the service during the past year has been principally as follows:

With vital statisticians and epidemiologists in various States and cities on matters affecting statistical procedure, report forms for disease notification, planning of epidemiological studies, and the like.

With committees and others on statistical questions of the American Public Health Association, American Statistical Association, the Service of Epidemiological Intelligence and Public Health Statistics of the Health Section of the League of Nations, the International Institute of Statistics.

With the health demonstration personnel of the Milbank memorial fund, Statistician Sydenstricker having been detailed for part of his time as statistical consultant to that organization.

## STREAM POLLUTION

The studies of stream pollution which have been made during the past year have been carried out in pursuance of a general plan which has been followed continuously for a number of years, with substantially the same organization and for the most part the same personnel as in the preceding year.

This work is under the direction of Surg. W. H. Frost, with Sanitary Engineer J. K. Hoskins in immediate charge of the laboratory at Cincinnati, Ohio, which is the base for laboratory research and for field parties sent out to other localities. A group of consultants consisting of Dr. Stephen A. Forbes, of the Illinois State Water Survey; Dr. Edwin O. Jordan, of the University of Chicago; Mr. Langdon Pearse, sanitary engineer of the Sanitary District of Chicago; Mr. Earle B. Phelps, of Columbia University; and Dr. Lowell J. Reed, of Johns Hopkins University, keeps in close touch with the work, giving advice in the shaping of plans. Individuals of this group have also given material assistance in matters of technical detail in their respective fields.

The principal activities during the past year have been—

(a) Field studies of the conditions of pollution in certain waterways, selected for study because of some special consideration.

(b) Laboratory research designed to throw more light on the biology of wastes and purification.

(c) Studies, both collective and experimental, of the actual potential efficiency of modern water purification plants using rapid sand filtration and chlorination.

(d) Miscellaneous activities, chiefly in the way of cooperation with other agencies engaged in studies of stream pollution and allied subjects.

## FIELD STUDIES

(1) At the request of the State health authorities of Illinois and Indiana and the municipal authorities of Chicago, a study of the sewage pollution of Lake Michigan in the vicinity of the Indiana-Illinois State line was begun in September, 1924, under the immediate direction of Sanitary Engineer H. R. Crohurst and Passed Asst. Surg. M. V. Veldee, with the active collaboration of the State and municipal authorities, especially the Sanitary District of Chicago.

The field work on this investigation was brought to a close in November, 1925, after having been continued through somewhat more than a year. During this time, except when interrupted by unfavorable weather conditions, samples were collected at short intervals from a large number of sampling stations established in this area of the lake and were examined bacteriologically in a temporary laboratory established in Chicago for the purpose. At the same time a comprehensive sanitary survey was made to locate and appraise sources of pollution.

The lake area studied is of especial sanitary importance because it is the source from which cities in both States draw their water supplies, and because the safety of these supplies is seriously menaced by the increased pollution which has followed the great industrial development on the lake shore. It was the purpose of this study to

determine more precisely and in more detail than heretofore the distribution of sewage pollution in this area of the lake, its relation to particular sources, and, to some extent, its relation to changes in weather conditions, especially to the direction and velocity of the prevailing winds. It is believed that this purpose has been accomplished, and a comprehensive report, presenting the results of the study, including records of the quality of the municipal supplies, and leading to recommendations for remedial measures, has been drawn up and forwarded to the State and municipal authorities directly concerned. It is not proposed to publish the report, since its interest and importance are local rather than general.

(2) Early in the year requests were received from the State health authorities of Minnesota and Wisconsin for cooperation with them in a study of the pollution of the upper Mississippi River. A preliminary survey and conferences showed that an intensive study of conditions in the upper Mississippi, especially in the vicinity of Minneapolis and St. Paul, would not only be of value to the States and cities immediately concerned but might also be expected to yield information of more general significance in relation to certain basic problems of pollution and natural purification. Arrangements were accordingly made for undertaking a joint investigation, to be supported chiefly by the States and cities, under the direction of the service. Accordingly, Sanitary Engineer H. R. Crohurst was assigned in March, 1926, to take charge of this study, which has since been satisfactorily organized and is now well under way. The plans made contemplate continuance of field work, at least through the summer and autumn of 1926, and longer if practicable.

#### EXPERIMENTAL STUDIES OF THE PHENOMENA OF NATURAL PURIFICATION

Such careful and continued observations as have been made on the Potomac, the Ohio, and the Illinois Rivers have served to measure with fair precision the rates at which certain processes of natural purification proceed under the conditions obtaining in these streams during the period of study. A better understanding of these processes which will permit of making the best use of them in practice requires, however, that they be studied in more detail and under a wider range of variation in conditions affecting their rate. Accordingly, for several years past an important section of the work has consisted of the study of natural purification processes as exhibited in the laboratory under controlled conditions which may be varied at will. These studies have been conducted in the Cincinnati laboratory chiefly by Associate Chemist E. J. Theriault, studying in detail the nature and rate of chemical changes in polluted waters; Associate Bacteriologist C. T. Butterfield, studying the relations of certain groups of bacteria to these changes; and Special Expert (in limnology) W. C. Purdy, investigating the influence of plankton. To a considerable extent these three investigators have collaborated in experiments requiring technical knowledge of chemistry, bacteriology, and limnology.

As a result of these studies important additions have been made to previous knowledge of the rate of oxidation of organic matter in water, which is of practical importance as establishing a better

basis for estimating the oxidizing capacity of streams; and it has been shown that certain forms of plankton, through their effect on bacterial activity, exert an important influence on oxidation (see also Laboratory Bulletin 104, "Investigations on Pollution and Sanitary Condition of the Potomac Watershed"). Two papers prepared by Mr. Theriault will be ready for publication in the near future, one reviewing comprehensively previous studies of biological oxidation, the other presenting the results of further observations made recently at Cincinnati. At the present time experiments are being made with artificial channels so constructed as to reproduce on a small scale the physical conditions existing in natural streams.

While researches of this kind, dealing with the biological theory of natural purification, may seem somewhat remote from the immediate administrative problems of stream pollution control, they have already found important practical applications in the improvement and simplification of methods for testing sewage, sewage effluents, and polluted streams, and in facilitating the calculations and forecasts requisite for planning comprehensive control measures.

#### STUDIES OF THE EFFICIENCY OF WATER PURIFICATION

Since 1924 systematic studies of the bacterial efficiency of water-purification plants of the type most commonly used in this country, namely, rapid sand filters supplemented by chlorination, have been in progress under the direction of Sanitary Engineer H. W. Streeter, with the constant advice of Mr. Joseph W. Ellms, special consultant in water purification. The purpose of the studies has been to determine more precisely the relation between bacterial content of the untreated water and that of the effluent from the purification plant, to ascertain how this relation is affected by changes in the character of the raw water and in operation of the purification plant, and to study the practicability and cost of effective modifications in operation or design. The method pursued has been first to make a detailed study of the raw water, the design and operation of the plant, and the quality of the effluent at a number of municipal filtration plants selected as representative, and then to extend the observations by operations of an experimental filtration plant established at the Cincinnati laboratory.

The collective study of municipal filtration plants, begun in the summer of 1923 and continued, as regards field work, until the autumn of 1924, has now been completed, and a report presenting and discussing the collected data is being prepared for publication.<sup>8</sup> In addition to the completion of this report the work during the past year has consisted of observations on the experimental filtration plant, which has been in practically continuous operation. Two papers, one describing the plant and one giving a preliminary review of results, have been submitted for publication, and a more comprehensive report on the earlier series of experiments is well on the way to completion. The general plan and purpose of the studies and some of the results obtained have also been presented more or less informally at several meetings of technical organizations which

<sup>8</sup> A preliminary report on this study appeared in the Public Health Reports, Jan. 30, 1925. Reprint No. 987.



are especially interested in water purification. It is proposed to continue this work at least one more year, taking up in succession a series of experiments which are already pretty clearly defined.

EPIDEMIOLOGICAL STUDY OF TYPHOID FEVER IN RELATION TO BACTERIAL QUALITY  
OF WATER SUPPLIES

It is obviously desirable that studies of the bacterial efficiency of water purification and of the bacterial quality of municipal water supplies should be extended to include a study by epidemiological methods of the actual danger in terms of infection risk of water supplies of known bacteriological quality. It is especially important, in connection with the establishment of bacteriological standards for water supplies, to have more definite information as to the *lower* limits of bacteriologically demonstrated contamination which may be associated with epidemiological evidence of actual water-borne infection. The problem is of such complexity that any exact solution is probably impossible. It has, however, been evident for several years that certain cities situated on the Ohio River and taking their water supplies from that stream offered unusually favorable opportunities for a study of this important question for the following reasons: Unusually exact records of daily examination of the water supplies of these cities are available currently and for several years past; the raw water is so dangerously polluted that even a brief accidental lapse in the efficiency of artificial purification is likely to result in water-borne infections with typhoid fever; the endemic prevalence of typhoid fever in these cities is low, so that even a small water-borne epidemic could probably be identified by careful epidemiological study; and even without intensive study the records of these cities in recent years show evidence which is at least suggestive of several minor water-borne epidemics.

Accordingly, Past Asst. Surg. M. V. Veldee was detailed in March, 1926, to undertake an intensive study of the occurrence of typhoid fever in these cities, in cooperation with the State and municipal health authorities. Unfortunately, a special exigency of the service made it necessary, before the end of the year, to assign Doctor Veldee to other duty, with consequent discontinuance of this study. It is proposed, however, to resume it within the next year.

MISCELLANEOUS ACTIVITIES

The compilation of the data collected in a field study and the preparation of a report properly presenting the results is usually an undertaking which is fully as laborious and time consuming as the original field work, and, as extensive field studies have been in progress continuously for a number of years, leaving a scant personnel available for the preparation of reports, a considerable accumulation of material had been carried over from previous years. Special attention has been devoted in the past year to completion of reports on such accumulated data. Two reports on the pollution and natural purification of the Illinois River have been completed—one a general report dealing principally with hydrometric, chemical, and bacteriological examinations, and the other presenting and discussing the results of a survey of the plankton. With the comple-

tion of these and the other reports which have been mentioned practically no material remains for compilation except the data currently collected from studies now in progress, and the personnel are more free than for several years past to devote their full time to new work.

From time to time during the year occasion has arisen for special work not included in the regular program of studies planned but closely related to either the current or the past work of the station. For the most part this extra work has been in the way of cooperation with other agencies engaged in work related to stream pollution. Thus, Sanitary Engineer J. K. Hoskins has been detailed for conference with the State water commission of Connecticut relative to inauguration of a program of stream-pollution control in that State, conference with certain officers of the service in regard to a study of the pollution of bathing beaches in the District of Columbia, and inspection of certain water supplies for the Veterans' Bureau. Sanitary Engineer H. W. Streeter has collected data on the status of pollution from by-product coke-oven wastes in the Ohio River, and prepared a detailed memorandum on the subject for the information and use of the Association of Health Departments of Ohio River States. Associate Bacteriologist C. T. Butterfield was assigned for a short while to assist in organizing the laboratory established at Norfolk, Va., in connection with studies on the sanitary control of shellfish, and has served as one of the referees on bacteriological methods for the American Public Health Association committee on standard methods. Associate Chemist E. J. Theriault has visited Chicago for conference with technical experts of the Chicago Sanitary District relative to the technique and interpretation of biological oxygen demand determinations; and Special Expert W. C. Purdy has been detailed to California to assist State authorities in a study regarding the influence of certain plankton (algæ) toward preventing the breeding of anopheline mosquitoes.

The officers assigned to stream-pollution investigations have from time to time prepared a number of memoranda and letters giving more or less detailed technical information on stream pollution and related subjects. Also, during the year several organizations have, by permission of the Surgeon General, detailed members of their technical staffs to the Cincinnati laboratory to acquire familiarity with the technical methods used there. While such incidental duties have occupied, in the aggregate, a considerable proportion of the time of the station personnel, it is believed that the results achieved in promoting effective cooperation with other agencies have fully compensated for interruptions to the regular program of investigations.

#### HYGIENIC LABORATORY

Surg. G. W. McCoy was continued as Director of the Hygienic Laboratory and Surg. R. E. Dyer as Assistant Director.

The chief of the section on infectious diseases, Surg. J. P. Leake, was relieved from the laboratory early in the fiscal year to take charge of the field investigations of the possible hazards associated with the use of tetraethyl lead in motor fuels. Several of the scientific workers have resigned and their places have not yet been filled, owing to the difficulty of obtaining successors at the salaries offered.

Three Hygienic Laboratory bulletins were issued during the year, and a considerable number of professional papers relating to work carried on in the laboratory were published by members of the staff in Public Health Reports and in other scientific journals from time to time throughout the year.

At the end of the fiscal year the library of the laboratory contained a total of 12,176 bound volumes, of which 713 were accessioned during the year. The pamphlet collection received several hundred additions. The bibliographic reference work of the library has increased considerably during the past year, not only for members of the laboratory staff, but for the field service. A number of photostat copies of articles were prepared for the staff and field service. Work was continued on the arrangement, classification, listing, and storing of the duplicate collection of periodicals, serials, and State and municipal health publications.

#### DIVISION OF PATHOLOGY AND BACTERIOLOGY

The division of the work, routine as well as research, has continued under the following sections, as for several years past: Nutritional diseases, infectious diseases, the biologics-control work, and pathological studies.

##### STUDIES OF NUTRITIONAL DISEASES

These researches were continued under the direction of Surg. Joseph Goldberger, assisted by Passed Asst. Surg. R. D. Lillie. Further work indicates that black tongue in the dog and pellagra in man are strikingly similar conditions as respects etiology.

Work on white rats indicate that in these animals there may be induced a pellagra-like condition.

A full report will be found under the report on field studies in nutrition.

##### STUDIES OF INFECTIOUS DISEASES

*Tularaemia.*—Researches by Surg. Edward Francis have established (1) the presence of the disease in Japan, and (2) the existence of the disease in eight States hitherto not included in its area of geographic distribution, which now comprises 24 States, the District of Columbia, and Japan.

The occurrence in eastern Montana of a case of tularaemia in which the only apparent agency of infection was the bite of a coyote, led to experiments which have demonstrated the susceptibility of coyotes and have added the bites of infected animals to the previously known means by which human infection may be acquired. Mention of a study of tularaemia carried on at the spotted-fever laboratory at Hamilton, Mont., is made on page 36.

*Rocky Mountain spotted fever.*—An account of the studies of Rocky Mountain spotted fever is given on pages 33-36.

*Tuberculosis.*—The investigations were continued under the direction of Pathologist William Charles White. The plan of national research in tuberculosis which the Public Health Service is carrying on in conjunction with the National Tuberculosis Association has developed a wider scope. So little progress was made by individual

tuberculosis research that a new plan was demanded; and such a plan was devised which outlined the problems that must be solved and which apportioned each problem to an investigator highly skilled in that specific phase. The plan is mobilizing widely varying research facilities throughout the country where they exist rather than attempting to gather them together into one institution. It has worked with success and, under the direction of Doctor White, the following researches are being carried on:

1. The chemistry of the tubercle bacillus, its proteins, carbohydrates, and lipoids: The bacilli grown on a synthetic medium have been supplied by two manufacturing houses and are being analyzed by experts in six university and institutional laboratories.

2. The biology of the tubercle bacillus: The Hygienic Laboratory and one university laboratory are engaged in this study.

3. The cells of the body involved in tuberculosis: Five university laboratories are taking part in this study, besides the Hygienic Laboratory, which latter is making a study of the chemistry of the epithelioid cells in which the tubercle bacillus lives during the early period after infection.

4. Differential anatomical studies of different animals to find out the reason for the location of tuberculous lesions: These are being carried on in one university laboratory.

5. The establishment of X-ray standards: This is being conducted in three university hospitals.

During the year, under the direction of the Surgeon General, a conference was held to determine a method for the standardization of tuberculin, at which were represented the Bureau of Animal Industry, the United States Public Health Service, the National Tuberculosis Association, and a group of experts who acted as a council of advisors.

*Epidemic encephalitis.*—Investigations of this subject have been carried on throughout the year by Associate Bacteriologist Alice C. Evans. The streptococcus which has been described by certain other workers as the etiologic agent of this disease was obtained at necropsy from a case which died in an acute attack. A study of the organism was made, and apparently it was found to pass through a complex life cycle, one of the phases in the cycle being a spore-forming rod. A syndrome, in many respects similar to epidemic encephalitis, was produced in laboratory animals by inoculations with this organism. The same kind of organism, exhibiting the same variety of phases and similar pathogenic properties, was obtained from the spinal fluid from two chronic cases of the disease, from the blood in an acute case, from a sample of encephalitis "virus" from England, and from five samples of "herpes virus" collected from several laboratories.

*Vaccination sequelæ.*—This investigation has been carried on by Surg. Charles Armstrong. Data were collected concerning 38 cases of postvaccinal tetanus which occurred in the United States during 1925. These studies have confirmed certain observations made earlier which have resulted in recommendations that small insertions of vaccine virus are advisable and that dressings should be avoided.

These studies seem to indicate that a high degree of susceptibility to vaccinia is essential for the development of postvaccinal tetanus,



as in every case for which full information is available the complication following a primary "take" was usually described as severe.

Numerous attempts to demonstrate tetanus organisms in vaccine virus, using various methods, culture media, etc., were uniformly negative.

*Trachoma.*—Cultural and pathological studies have been carried on throughout the year by Associate Bacteriologist Ida A. Bengtson in the branch laboratory at Rolla, Mo. There are no results available to warrant any definite statement at the present time.

*Pneumonia.*—This work has been continued under the direction of Special Expert R. L. Cecil at New York. Studies have been conducted on the duration of active immunity in vaccinated laboratory animals. The rôle of the leucocytes in immunity is being studied, but neither this nor the other problem has yielded definite results.

Several alleged cures for pneumonia have been tested clinically and experimentally, but without results that would warrant their general clinical use.

*Drug addiction.*—Further field work on this subject by Surg. Lawrence Kolb and Pharmacologist A. G. Du Mez supports the opinion that the prevalence of addiction is still being greatly exaggerated. Evidence continues to accumulate that the estimate of 110,000 addicts in the United States made in 1924 would be too high for the present time.

A special study of addiction was made in a southern community. This investigation suggested that addiction of therapeutic origin in the South constitutes a larger proportion of all addiction than it does in the northern communities.

*Typhus fever.*—Passed Asst. Surg. K. F. Maxcy continued field investigations of endemic typhus in the southern United States. A detailed clinical description of the disease was published in the Public Health Reports. Epidemiological observations were assembled and analyzed. Laboratory studies to establish the identity of the virus and its mode of transmission in nature were begun in the field and are being continued at the Hygienic Laboratory.

#### CONTROL OF BIOLOGIC PRODUCTS

*Standardization of antidysenteric serums.*—This work, which has been the major investigation of Associate Bacteriologist E. M. A. Enlows for several years, was completed. An antitoxin (goat serum) was prepared and a unit suggested for comparative purposes in the testing of commercial antidysenteric serums.

Studies on the toxins of *Eberthella dysenteriae* Shiga were carried to a point where it was felt advisable to discontinue the work. No clear-cut separation of the toxic substance or substances into an enterotoxin (endotoxin) and a neurotoxin (exotoxin) was effected; overlapping always occurred.

*Antivenom studies.*—Considerable interest has been manifested in the subject of a serum effective against the venom of North American serpents. Such antivenoms have been made on an experimental basis in the past, but none has been produced commercially which reaches a degree of potency when tested on experimental animals that warrants the belief that it would likely prove of practical serv-

ice in man. A difficulty in this particular field lies in the inability, under ordinary conditions, to have the serum administered sufficiently promptly to make it of value as an antidote to a poison which acts with the striking rapidity of the venoms of North American serpents.

*Diphtheria toxoid.*—Work on diphtheria toxoid, produced by the action of formalin on diphtheria toxin, has indicated that this product is at least as effective as 0.1 L+ toxin-antitoxin mixture in the production of immunity in guinea pigs, and has the advantage of freedom from toxic reaction. Specifications for its testing have been prepared but to date no license has been issued, probably due to the disinclination of manufacturers to substitute a new product for one which has been proved by trial.

*Pollen extracts.*—Continuation of sensitization experiments with pollen extracts in guinea pigs has shown that these products are capable of producing anaphylaxis in these animals, which, in its manifestations in the animal, is indistinguishable from that produced by horse serum. This sensitive condition persists for more than one year.

*Scarlet-fever preparations.*—The work on these preparations has been carried on by the assistant director. In connection with the work on the standardization of the biologic products employed in the prevention and treatment of scarlet fever, a toxin was prepared and standardized at the Hygienic Laboratory. This toxin is now in use for distribution to the manufacturers of biologic products as a control toxin with which toxins intended for the market may be compared.

For a better standardization of the antitoxin, investigations were made to determine a satisfactory method of preparing stable antitoxin for distribution as a standard for comparison.

Samples of different antitoxins were dried in ampules preparatory to distribution to several research workers who have indicated their willingness to assist in the determination of potency.

#### *Tests of biologic products*

Product	For sterility	For potency
Diphtheria antitoxin.....	54	70
Tetanus antitoxin.....	54	55
Botulinus antitoxin.....	3	1
Antipneumococcus serum.....	53	33
Antimeningococcus serum.....	82	97
Antidysenteric serum.....	17	19
Miscellaneous serums.....	66	-----
Vaccine virus.....	14	-----
Rabies vaccine.....	29	10
Antityphoid vaccine.....	44	52
Miscellaneous vaccine.....	357	-----
Diphtheria toxin antitoxin mixture.....	166	152
Diphtheria toxin (Schick test).....	11	89
Pollen extracts.....	34	-----
Tuberculins.....	53	-----
Scarlet fever streptococcus antitoxin.....	19	(1)
Scarlet fever streptococcus toxin for Dick test.....	16	(1)
Scarlet fever streptococcus toxin for immunization.....	21	(1)
Erysipelas streptococcus antitoxin.....	1	-----
Total.....	1,094	578 1,094
Combined total.....	-----	1,672

<sup>1</sup> Passed on record of manufacturer's tests.

*Toxicity tests*

Commercial samples of arsenicals	Total examined
Arsphenamine.....	84
Silver arsphenamine.....	7
Neolarsphenamine.....	397
Sulpharsphenamine.....	142
Sodium arsphenamine.....	4
Total.....	634

## STUDIES IN PATHOLOGY

The work carried on in this section falls into two divisions: (1) Study of the gross and minute pathology in connection with researches carried on by the different investigators in other sections and divisions of the Hygienic Laboratory; and (2) the study, from the point of view of pathology, of material removed at operation or during post-mortem examination. The material coming under (2) is received chiefly from marine hospitals.

*Specimens routinely examined*

Heads for rabies.....	68	Blood counts.....	30
Urine.....	102	Cultures (identification).....	100
Tissue.....	303	Catgut (sterility).....	30
Water.....	52	Miscellaneous.....	21
Wassermanns.....	1,907		
Sera (tularaemia).....	179	Total.....	2,841
Sera (miscellaneous).....	49		

## DIVISION OF ZOOLOGY

The work of the Division of Zoology was conducted under the direction of Prof. C. W. Stiles.

*International Commission on Zoological Nomenclature.*—Cooperation with the International Commission on Zoological Nomenclature has continued in the same manner as in preceding years. The various governmental departments have frequently referred questions to the Division of Zoology for opinion.

*Index catalogue of medical and veterinary zoology.*—The second number of the host catalogue appeared during the year under the title "Key Catalogue of the Worms Reported for Man." This bulletin has been in such demand that a special congressional reprint was issued as House Document No. 16. The third number will go to press early in the next fiscal year, and other numbers will follow.

In preparing the catalogue of infections of the primates (apes and monkeys), the point has developed that the names for the experimental (laboratory) primates are far from uniform. An attempt was made in this catalogue to reduce this confusion.

*Examination of intestinal parasites for diagnosis.*—As in previous years, specimens have been examined for various Government hospitals, State boards of health, universities, and practicing physicians, and reports have been made of the findings.

## DIVISION OF PHARMACOLOGY

Following are the principal investigations of the Division of Pharmacology, under the direction of Prof. Carl Voegtlin:

*Study of drugs for treatment of syphilis.*—The extensive work dealing with comparative sterilizing power of the most important arsenicals is almost completed. The results clearly indicate that Ehrlich's conception of the action of these remedies is essentially correct. There is all reason to believe that the drug kills the parasites directly. This is in conflict with the view of others that the drug in some obscure way stimulates an immune body production. The work, furthermore, supports the concept of the intensive treatment and indicates that the so-called lymph gland transfer is a better criterion of cure than the reinoculation test.

The deplorable toxic reactions which sometimes follow arsenic treatment suggested the search for drugs which might prevent such reactions. The results of recent experiments indicate that sodium hyposulphite (which is known as a remedy for arsenic dermatitis, etc.) does not decrease the parasitocidal action of the arsenicals in experimental syphilitic infection. The simultaneous use of hyposulphite and arsenicals may, therefore, prove of practical value in the prevention of toxic reactions due to the arsenicals.

*Cancer studies.*—This work was carried out along the same lines as last year. A number of chemicals were studied as to their influence on tumor growth. This included also colloidal lead, which was recommended by Blair Bell and his associates of the University of Liverpool. All of these carefully performed experiments have yielded negative results.

*Nutritional studies.*—Extensive experiments with rats have shown that autoclaved yeast evidently contains a hitherto unrecognized dietary factor.

Elaborate studies were also made on the influence of changes in the vitamin content of the diet on the susceptibility of animals to certain poisons. It was found that vitamin deficiency greatly increases the toxicity of certain poisons.

*Permeability studies.*—The penetration into *Valonia* (a marine alga) of certain oxidation-reduction indicators, developed by the Division of Chemistry, was investigated under various conditions of hydrogen ion concentration and light rays. It was found possible to estimate the oxidation potential of the sap of a living cell directly.

*Biological significance of glutathione and cystine.*—Previous work had shown that these important constituents of tissues are in some way or other concerned in oxidation reduction. A careful biological analysis indicates that the poisonous action of prussic acid is due to an interaction of this substance with the glutathione of the tissues. This work has thrown additional light on the obscure problem of the mechanism involved in the biological utilization of oxygen in showing that the glutathione system is an essential factor.

The interesting discovery was made that isolated smooth muscle (intestine) can be sensitized to cysteine. This observation is bound to assist in the elucidation of the physiology and pathology of smooth muscle.

*Drug addiction.*—Pharmacologist A. G. DuMez, who has collaborated with Surgeon Kolb in this investigation, resigned toward the end of the year. This study is referred to on page 63.



*Miscellaneous.*—Pharmacologist DuMez represented the Government at the International Conference for the Unification of Heroic Remedies held at Brussels in September. This conference adopted the recommendations of the Second International Conference for the Biological Standardization of Remedies, which was attended unofficially by the chief of the division. The work of this latter committee has resulted in great progress in the biological standardization of pituitrin, digitalis, insulin, arsenicals, etc. Its recommendations are being adopted in this and other countries for the official control of these important remedies.

#### DIVISION OF CHEMISTRY

The Division of Chemistry, under the direction of Prof. W. Mansfield Clark, conducted investigations in the following subjects:

*Oxidation-reduction processes.*—Having demonstrated by investigations, reported in previous years, that certain chemical reactions between organic compounds can be conveniently formulated in terms of the transfer of electrons and experimentally measured with electrical methods, the Division of Chemistry has extended its studies to the following specific subjects:

Benzidine and other colorless compounds of analogous structure are transformed to lightly colored "oxidation products" by processes involving withdrawals of two electrons from each molecule. The oxidation product then combines with the residual "reductant" to form a highly colored substance, and it is the production of such highly colored substances which is utilized in a variety of biochemical tests and staining reactions. In the design of benzidine- and similar reagents, in the discovery of conditions governing the color production and in the interpretation of the significance of the results of the application of these reagents there has heretofore been no guide but empiricism. There have now been established<sup>9</sup> quantitative data and a precise formulation of equilibrium states in the reversible oxidation-reduction of such systems. Thus there has been outlined the conduct of one of the most complex systems yet investigated. However, the very complexity which is thus revealed, when considered in conjunction with serious consequences of the instability of these systems, shows definitely that benzidine- and similar reagents are unsuitable for the many purposes for which they are now used.

The study of these benzidine types of systems was made possible by the ability of the electrical methods to reveal transitory equilibrium states. As the methods are pushed further toward the investigation of reactions accomplished in the normal or pathological metabolism of the living cell, the study of transitory equilibrium states becomes of greater importance. Consequently considerable time has been used in the synthesis of compounds designed in the hope that they will provide favorable materials for such studies.

Previous investigations of reductive tendencies in suspensions of living cells were consolidated and embodied in a paper on the subject, the tenth of the series.<sup>10</sup> Aside from several important implications of theoretical importance set forth in this paper, there is

<sup>9</sup> Supplement No. 54 to the Public Health Reports, 1926.

described a method of experimentation which will probably be used extensively.

As reported last year, preliminary studies of the use of electrical potential methods in following disinfection by iodine and chlorine were found to be of suggestive value to the theory of disinfection in general and to the chlorination of water supplies in particular. Accordingly, more systematic investigations were begun by an investigation of the "chlorine electrode."

In a sense incident to researches on oxidation-reduction previously reported, but having their own intrinsic values, are the researches being conducted upon the organic chemistry of the materials used. A compilation of literature upon reactions used in tests for phenolic compounds, an experimental demonstration of the two-stage nature of the widely used Millon's reaction, and the development of an extremely delicate new test for phenol are developments which will be reported separately when brought nearer to completion.

*A specific test for cysteine.*—An increasing appreciation of the importance of sulphur metabolism, normal and abnormal, has made it advisable to continue the study and the application of a specific test for cysteine previously reported. It is now possible with this test to distinguish cystine, cysteine, glutathione, etc.

*Acid-base equilibria.*—A formulation of the main features of acid-base equilibria in milk was made. Improvements in the preparation and purification of new acid-base indicators were aids to commercial production.

*Proteolytic enzymes of bacteria.*—Synthetic culture media in which reproducible values for the gelatinase formed by *Proteus vulgaris* (*Bacillus proteus vulgaris*) were constructed and the influence of calcium and magnesium upon the production of gelatinase was studied.

*Analysis of arsenicals.*—The Division of Chemistry has charge of the chemical analysis of arsenicals, the manufacture of which is licensed by the department. In general a high standard in the chemical qualities of these products has been found by the tests of the last fiscal year. In certain instances the application of the new methods of determining the distribution of sulphur in the sulphur-arsenicals has given evidence that particular preparations are not wholly of the type the manufacturer intended to produce.

*Lead analysis.*—The Division of Chemistry took part in the investigations concerning the possible hazards in the use of tetraethyl lead by conducting an extensive series of analyses. These are reported elsewhere.

*Miscellaneous.*—Assistance was given to the pellagra studies by analyses of feeding materials. Standard solutions were prepared for other divisions of the Hygienic Laboratory or for other offices of the service. Some 251 miscellaneous analyses were made. Several memoranda upon various subjects were prepared in answer to requests of correspondents or other offices of the service. Assistance was given to the investigation on malaria by the preparation or the procurement of materials to be tested as mosquito larvicides. Bibliographies on hydrogen ion concentration and anaerobic culture methods were kept up to date.

## VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS

The provisions of the law of July 1, 1902, governing the manufacture, importation, and sale of viruses, serums, toxins, and analogous products have been carried out under the supervision of the Director of the Hygienic Laboratory and under the immediate direction of Surg. W. T. Harrison. This control work has been of great value to the public in securing for them pure and potent biologic products and in preventing their exploitation by worthless preparations.

Thirty-seven domestic and 11 foreign establishments held licenses under this law at the close of the fiscal year. There are now 98 different biologic products licensed for interstate traffic.

An account of the investigations relating to these products conducted at the Hygienic Laboratory is given on pages 63-65.

## COOPERATION WITH STATE BOARDS OF HEALTH

In addition to the foregoing references to investigations made under this division at the request of and in cooperation with the health organizations of a number of States, the following investigations were made during the year:

An investigation by Surg. G. C. Lake of an outbreak of a disease in southwest Virginia, which proved to be a glandular febrile type of tularæmia; investigations by Surg. Charles Armstrong of an outbreak of poliomyelitis in Louisville and other places in the State of Kentucky and of a milk-borne outbreak of septic sore throat in Brunswick, Ga.; a study of communicable-disease control in the State of North Carolina, by Surg. Thomas Parran, jr.; the examination of a case of typhus fever in Richmond, Va., by Surg. Joseph Goldberger; and an investigation of a case of suspected leprosy in Goldsboro, N. C., by Surg. G. W. McCoy.

## MISCELLANEOUS

The results of the studies made by the Scientific Research Division have been brought to the attention of health agencies and the public by the distribution of its publications, conferences with health authorities, addresses at meetings, and by means of correspondence and press articles.

An important work of this division is the reviewing of scientific papers and articles on public-health subjects prepared by service officers for publication. During the past year this work has included 3 Hygienic Laboratory bulletins, 6 Public Health Bulletins, 5 supplements, and 94 articles submitted for Public Health Reports or outside scientific journals.

The details of the representatives of the Public Health Service to meetings of scientific and public-health associations have been arranged through this division. In many cases papers are given presenting the work of the service, particularly the results of its investigations.

## DIVISION OF DOMESTIC (INTERSTATE) QUARANTINE

In charge of Asst. Surg. Gen. W. F. DRAPER

The activities of this division during the past fiscal year to suppress epidemics and to prevent the interstate spread of disease have included: (1) Plague-suppressive measures; (2) activities for the eradication of trachoma; (3) the conduct of studies and demonstrations in rural sanitation; (4) the investigation of sanitary conditions of areas used for growing shellfish for shipment in interstate traffic; (5) the carrying out of service policies for the prevention of epidemics by assisting State health departments in establishing and improving local health service; (6) the improvement of sanitary conditions in the national parks; (7) the control of water supplies used for drinking and culinary purposes by interstate carriers; (8) supervision over sanitary and health conditions on interstate carriers; and (9) mosquito-control measures along the Texas-Mexican border to prevent the spread of yellow fever should it be introduced.

### PLAGUE SUPPRESSIVE MEASURES IN CALIFORNIA

Plague suppressive measures in California may be considered under the following divisions:

- (a) Plague in Los Angeles.
- (b) Plague in Oakland.
- (c) Ground-squirrel control in the field.
- (d) Rodent survey and sanitary inspections in San Francisco.
- (e) Pathological and bacteriological examinations in the Public Health Service laboratory.

### PLAGUE IN LOS ANGELES

The Public Health Service assumed charge of the plague suppressive measures in Los Angeles, Calif., on June 16, 1925.

On October 1, 1924, pneumonic plague made its appearance in Los Angeles. From October 1, 1924, to January 10, 1925, there were reported 33 cases of pneumonic plague, with 31 deaths, and 8 cases of the bubonic type, with 3 deaths, making a total of 41, of which 7 occurred in the county of Los Angeles. Two recoveries from pneumonic plague were recorded, the diagnosis in each case being based on clinical evidence only.

Upon the recognition of the disease, the city board of health took immediate steps to enforce measures for the control of the epidemic. A quarantine area was established, all persons suffering with the disease were immediately hospitalized, and contacts were placed in strict quarantine.

A general campaign was instituted by the State board of health for the control of rodent plague, consisting of trapping, poisoning,



disinfecting, and wrecking, followed later by rat-proofing. The work remained under this direction until June 2, 1925. During this period 190 rats and 9 squirrels were found to be plague infected. The epizootic, however, was not confined to the city, 76 infected rats and 2 ground squirrels having been collected in the county of Los Angeles.

On June 3, 1925, the city board of health assumed control of the work, and conducted the campaign until arrangements could be made for assistance from the Public Health Service.

During the months of May and June, 1925, several meetings were held at which the general plague situation, methods of control, and finances were discussed. The meetings were attended by a representative of the Public Health Service, members of the board of health of the State of California, the board of health of the county of Los Angeles, and the board of health of the city of Los Angeles; also representatives from the larger community bodies in the city. Resolutions were formulated, introduced, and adopted, to invite the Surgeon General of the Public Health Service to take charge of the plague eradication measures. There were no objections. An invitation was then forwarded to the Surgeon General from the mayor of the city of Los Angeles.

Asst. Surg. Gen. Rupert Blue, who was on the field, was directed to take over the work June 16, in cooperation with the city department of health, and 10 commissioned officers were immediately ordered to Los Angeles to assist him. These officers, several of whom had had experience in plague suppressive measures, had arrived and were assigned to their respective duties on or before July 15, 1925.

From June 16 until July 1, 1925, the activities consisted mainly of taking over the personnel, checking, reconditioning, and listing all supplies and equipment, purchasing new material and equipping personnel, preparatory to reorganizing. July 1, 1925, may be stated as the official date for the beginning of operations.

*Organization.*—Upon assuming charge of plague-eradication measures, Asst. Surg. Gen. Rupert Blue established headquarters at 1015 East Eighth Street, a centrally located building with sufficient space for offices and a laboratory. It did not provide, however, storage rooms and yard space for supplies, materials, and transportation. This space was provided at District No. 9, located at 1807 East Seventh Street, a short distance from headquarters.

The staff of the medical officer in charge was composed of Surg. Carroll Fox, in charge of the laboratory; Surg. H. F. White, executive officer, and the following named officers for field work: Surg. T. J. Liddell, Surg. J. G. Wilson, Surg. Carl Michel, and Surg. H. E. Trimble; Asst. Surgs. Carl E. Rice, E. E. Huber, A. S. Rumreich, and J. T. Harper; and Acting Asst. Surg. J. J. Mahoney. Acting Asst. Surgs. Benjamin Blank and Joseph A. Wagner were employed for the inspection of the dead. Pharmacist Paul C. Jones acted as chief clerk at headquarters. An officer was placed in charge of each district, to whom was assigned a force of employees consisting of stenographers, inspectors, foremen, and trappers.

The plan of organization adopted in Los Angeles was that of the San Francisco campaign of 1907, which organization had also given

satisfactory results in New Orleans and Texas, and which is believed to be well adapted to the conditions usually found in large American cities.

Fumigators, wreckers, poison distributors, hunters, and miscellaneous personnel were attached to headquarters, to be assigned for temporary duty in the various districts as needed. All of the personnel, paid from local appropriations except the inspectors, was secured from the eligible civil-service list of the city, the officer in charge having no discretion in the selection of the same, and in many instances men were assigned to duty who were not qualified by education or experience for the positions. Owing to local civil-service regulations, many difficulties were experienced during the campaign in the direction and discharge of personnel. Inspectors were selected at headquarters and assigned to districts for duty. With few exceptions the men were proficient and their services satisfactory.

It may be pertinent to remark here that in selecting an emergency force it would be in the interest of efficiency and economy if some provisions could be made whereby civil-service regulations could be waived.

Each officer was provided with an office centrally located in the district, and was furnished with a clerical force and means of transportation. The sanitary district was the unit of field operations, subject to direction from headquarters. Each district operated as a unit for trapping, rat-proofing, and the handling and treatment of infected foci. Daily reports were required from each district giving the rat catch, a summary of rat-proofing, and wrecking which had been accomplished. A personnel card was also submitted daily to headquarters for tabulation.

*City of Los Angeles and its environs.*—The city of Los Angeles, at present comprising about 420 square miles, extends along the Pacific Ocean, with the ports of Wilmington and San Pedro, the recreation city of Venice, a short stretch along the foot of the Santa Monica Mountains; thence through Topanga Canyon to Calabasas along the Simi foothills; thence along the base of the Santa Susana and San Gabriel Mountains; and south in an irregular line to Wilmington. Within its boundaries are smaller incorporated municipalities such as Santa Monica, San Fernando, and the independent incorporated towns of Hawthorne, Inglewood, and Torrance. Adjoining its boundaries are larger incorporated municipalities such as Burbank, Glendale, Vernon, and the cities of Pasadena and Long Beach.

The elevation within the city boundaries varies from sea level to about 300 feet at the city hall, and to an elevation of about 1,700 feet near San Fernando. While Los Angeles lies on a general slope from the San Gabriel Mountains to the sea, the sloping contours are broken by high hills such as Griffith Park and Beverly Hills, and by numerous shallow ravines, while the Los Angeles River traverses the greater part of the city. Los Angeles has an equable climate throughout the year. It has an average rainfall of about 10 inches, with little or no rain during the summer months. The city in area is one of the largest in the United States. It has a population of over 1,000,000.

One of the greatest difficulties experienced during the campaign was to cover the large territory with a limited personnel. There have been added, in recent years, many scattered subdivisions and many annexations of adjoining incorporated towns. The city has a large commercial and metropolitan district. The older districts are greatly congested, and many of the buildings were serious menaces as rat harborages. The residential sections spread over a large portion of the area and, generally speaking, were found to be relatively free from rats. In the open areas squirrel infestation was heavy.

The ports of San Pedro and Wilmington presented practically the same conditions as found in the city of Los Angeles. The docks along the water fronts were, in most instances, rat-proofed and relatively free from rodents. Conditions were not found in the ports to justify a conclusion that plague was introduced through maritime shipping.

*Legislation.*—In conducting the plague eradication measures in the city of Los Angeles, the question of legislation immediately arose. The authority upon which the work was to be accomplished was based on ordinance No. 50282, which had been passed by the council of the city of Los Angeles, and signed by the mayor on November 21, 1924.

The ordinance provided sanitary regulations for the protection of public health in the city of Los Angeles, and particularly to prevent the propagation and spread of bubonic plague through the medium of rodents. It covered such phases of the work as entering and inspecting and the abating of nuisances, for the elimination of rat harborages and the protection of food products. It provided for rat-proofing in a general way, but neglected to specifically set forth the proper methods to be used, the latter being left to the discretion of the health officer. It was not a strong law, nor a law to be desired for this important phase of the work.

A new ordinance was immediately drafted covering all the points in ordinance No. 50282 and also embodying specific instructions in regard to the rat-proofing which would be required on the various types of buildings in the city, and was presented to the authorities for consideration and adoption. Owing, however, to opposition on the part of the building department, some community bodies, and the prejudices of certain officials, it was not possible to secure the enactment of desirable legislation during the fiscal year.

Pending the adoption of a new ordinance, regulations were drafted setting forth in detail the necessary requirements, and with the consent of the health commissioner this phase of the work was developed and has been carried on throughout the year with excellent results. No affidavits have been filed against property owners.

The adoption of a new ordinance that would insure rat-proof construction in future building has been the subject of numerous conferences between the Public Health Service, the city authorities, the chamber of commerce, and certain unofficial improvement associations. As a result of these meetings, a preliminary draft of proposed amendments has been approved and forwarded to the city attorney and the building commission for consideration and transmission to the council. Although the draft does not embody all

the suggestions made by the service, there can be no doubt that it carries substantial improvements which will correct many of the imperfections of the old building code. The amendments originally recommended were based upon the habits of the three dominant species of rats found in Los Angeles; that is to say, burrowing, climbing, colonizing, gnawing, and migration.

The present status of legislation is that ordinance No. 50282, without consultation with or consent of the health officer of the city of Los Angeles, or consultation with representatives of the Public Health Service, has been repealed, effective July 1, 1926. The repeal of this law has left the health department without legal authority to proceed with emergency work unless general police power can be invoked to meet insanitary conditions as they arise from time to time.

At the close of the fiscal year the city of Los Angeles was free from plague, 85 to 90 per cent of the business places were in a rat-proof condition, and rodent infestation was reduced, but with no legislation providing for rat-proofing in any manner, a condition to be deplored.

*Publicity.*—The plague campaign was taken over by the Public Health Service eight months after the original outbreak, when there were no human cases occurring and plague in rodents was showing up at irregular intervals, a situation which dissipated any favorable public sentiment. The public was indifferent. The newspapers were only neutrally friendly and no publicity was to be had from any source whatever. In order to inform the public it was necessary to hold many public meetings, at which representatives of the Public Health Service and the city board of health talked on the subject of plague and eradication measures. At least 60 meetings were addressed, and these were largely attended by interested property owners. Information which was furnished in the addresses was well received and did much to create favorable sentiment. Had it not been for public speaking, very little rat proofing could have been accomplished. The citizens were very prompt in responding to requests made of them and showed a fine spirit of cooperation. In fact, there has been no opposition worthy of mention from the property owners to the rat-proofing campaign.

*Laboratory operations.*—The laboratory was directed by Surg. Carrol Fox from July 1, 1925, to March 19, 1926, at which time he was succeeded by Bacteriologist L. V. Dieter, who remained in charge until the close of the fiscal year.

The personnel consisted of 1 commissioned officer, 1 bacteriologist, 1 assistant bacteriologist, and 5 dissectors.

There were delivered to the laboratory during the year 255,720 rodents, as follows:

<i>Mus norvegicus</i> .....	58,189
<i>Mus alexandrinus</i> .....	11,783
<i>Mus rattus</i> .....	10,156
<i>Mus musculus</i> .....	123,434
<i>Citellus g. fisheri</i> .....	35,629
Miscellaneous rodents.....	16,529

All rodents received at the laboratory, with the exception of a greater percentage of mice and the putrid specimens, were dissected and examined closely for pathological lesions.



Beginning July 11, 1925, the rats received at the laboratory, regardless of species, were dissected; and of those in not too advanced stage of decomposition, portions of the spleen and liver were removed and mass inoculations made into guinea pigs. In the great majority of instances each inoculation was confined to the tissues from 10 rats. Besides the mass inoculations, rats showing suspicious lesions were inoculated separately into guinea pigs, subcutaneously, cutaneously, or both.

From November 19, 1925, mass inoculations were also made from all squirrels brought into the laboratory and from a certain percentage of *Mus musculus*.

The number of guinea-pig inoculations were as follows:

Number suspicious rats inoculated	89
Number suspicious rats inoculated (positive plague)	12
Number single inoculations (special)	104
Number mass inoculations (60,144 rats)	4, 204
Number mass inoculations (19,461 squirrels)	1, 030
Number mass inoculations (4,927 mice)	230

Total number of inoculations	5, 669
Total number of rodents inoculated	84, 751

Plague-infected rats were reported from the following locations:

Date reported	Location	Type inoculation	Number rats in group
July 31, 1925	Various locations	Group	1, 2 14
Aug. 13, 1925	315 South Broadway	Single	1
Aug. 22, 1925	312 South Broadway	Group	1, 3 2
Sept. 22, 1925	704 North Broadway	Single	1
Sept. 29, 1925	2773 West Pico	do	1
Oct. 2, 1925	704 North Broadway	Group	2
Oct. 12, 1925	2773 West Pico	do	3
Nov. 6, 1925	327 Marchessault	do	2
Total plague-infected rats			12

<sup>1</sup> Reported as 1 plague rat each.

<sup>2</sup> Varied.

<sup>3</sup> Norway.

In order to find infection not indicated by gross lesions and to insure the examination of a greater number of rodents mass inoculation was adopted as a routine measure by the laboratory workers.

The number of guinea pig inoculations enumerated above does not include a number of reinoculations that were necessary, both in order to confirm the diagnosis of plague in obscure cases and because of the fact that a considerable number of organisms that were found (even in rats and squirrels showing no suspicious lesions) would when inoculated into guinea pigs produce lesions that were suspicious enough to warrant reinoculations; and in some instances several reinoculations were necessary before a negative diagnosis could be established.

The laboratory workers encountered many organisms that resembled *B. pestis*, morphologically, in the rodents examined. Chief among these was an organism identified as belonging to the rat paratyphoid group, which was evidently harbored by rats without producing visible lesions, yet when inoculated into animals would pro-

duce small hemorrhagic buboes and swollen spleens and livers, which also showed a peppering of pin-point necrotic areas. Smears made from these showed the presence of bipolar organisms, morphologically *B. pestis*, others shorter and atypical, necessitating a series of reinoculations.

In the reinoculations plaguelike lesions would be greatly accentuated and the virulence of the organism enhanced both in the tissues and cultures obtained from the tissues. Death would occur in guinea pigs from cutaneous inoculation in from five to six days, with lesions closely resembling plague. The final determinations were made on cultural characteristics. It is quite probable that the presence of this group of organisms in the rat population can be accounted for more or less by the unauthorized use of several biological rat exterminators on the market.

Several strains of Gram negative streptococci also were encountered. These produced in inoculated animals an intense hemorrhagic and gelatinous, stringy, mucouslike edema, resembling very closely acute plague lesions. These lesions, however, were more easily ruled out as plague because, of course, cultures and smears showed it to be definitely a streptococcus infection.

In a large colony of rats taken from a garbage dump located near the city was found a pathological condition the nature of which has not been fully determined. Fifteen per cent of the rats showed enlarged, swollen spleens peppered with pin-point areas of necrosis closely resembling subacute plague as found in guinea pigs. Many experiments were undertaken with a view to demonstrating the nature of the lesions, both by animal inoculation and feeding, but with negative results. Attempts to obtain cultures from the lesions were also uniformly negative.

One other organism, *B. myxoides*, produced lesions resembling acute plague when inoculated intraperitoneally into a guinea pig. Smears made from the peritoneal fluid showed innumerable organisms practically indistinguishable from *B. pestis*. Determination could be finally made from cultures.

Tularemia was found in wild rats on three separate occasions. It was encountered last in a group of rats caught on September 15, 1925. This is believed to be the first time that the disease has been so reported. Considerable work has been done in order to determine the length of time that the rat could harbor virulent *B. tularensis* without showing lesions. At the close of the fiscal year it had been found that rats inoculated subcutaneously had harbored the organism for 87 days without any ill effects. This experimental work has not been completed.

*Flea survey (1925-26).*—Owing to the difficulty of obtaining properly trapped specimens, only a partial flea survey was made in the laboratory.

The following tables give the results of the survey as far as carried out:

Table 1

Total rats examined without fleas:

R. norvegicus	116
R. rattus	6
R. alexandrinus	10

## Total rats examined with fleas:

R. norvegicus	546
R. rattus	10
R. alexandrinus	11

Total rats examined for fleas<sup>1</sup> 699

## Fleas identified as follows:

Xenopsylla cheopis	2,446 or 91.09 per cent
Ceratophyllus fasciatus <sup>2</sup>	50 or 1.86 per cent
Ceratophyllus acutus	43 or 1.62 per cent
Ctenocephalus canis	15 or .55 per cent
Leptopsylla musculi	107 or 3.98 per cent
Hoplopsyllus anomalus	21 or .78 per cent
Pulex irritans	3 or .11 per cent

Total fleas identified 2,685

Average fleas per rat 3.8

Table 2

Date	Number of rats examined	Number of fleas found	Percentage of predominant types			
			X. cheopis	C. fasciatus	C. acutus	L. musculi
1925						
July	55	80	62.50	7.50	0	29.90
August	114	474	87.70	1.60	.63	5.70
September	63	140	72.80	14.30	.29	7.80
October	224	686	97.22	.58	1.02	1.73
November	188	866	95.80	.23	1.73	1.96
December	93	417	86.80	2.40	2.87	6.20

A number of other animals were examined for fleas, including foxes, wild cats, skunks, opossums, weasels, field rats and field mice, gophers, etc. A number of interesting specimens were procured and Surgeon Fox reports the finding of several entirely new species, and at least one new genus.

*Inspection of the dead.*—The inspection of the dead was under the direction of the officer in charge of the laboratory. Although no human cases of plague had been reported since January 10, 1925, it was considered necessary that a careful check be made on all deaths of a suspicious nature, and the cause of death confirmed.

Acting Asst. Surgs. Benjamin Blank and Joseph A. Wagner were employed for this purpose and were on duty from July 1, 1925, until February 15, 1926. By arrangements with the undertakers of the city, they investigated 3,057 deaths, in order to rule out the diagnosis of plague in any form. This phase of the work was discontinued after a period of four months had elapsed from the date of the last plague infected rat (November 6, 1925).

*Endemic plague.*—No human cases of plague were reported during the fiscal year. There were, however, investigated at the general hospital, three suspected cases of bubonic, and two suspected cases of

<sup>1</sup> Total count includes January, 1926, rats and fleas, but not the one rat mentioned below.

<sup>2</sup> In January, 1926, one *R. norvegicus* was trapped at 707 West Sixth Street, a residence, and was found to be infested with 181 *C. fasciatus*. As there were nearly 3.6 times as many fleas on this one rat as were found on all rats examined during the preceding six months, it would be misleading to include the January count in the above figures.

pneumonic plague. These were found to be negative after a careful checking in the laboratory.

*Epizootic plague.*—During the fiscal year the laboratory reported positive plague rats from six different locations in the city of Los Angeles, all of which, with the exception of the rats from 312 and 315 South Broadway, were widely separated and no connection could be traced between the foci. The greatest distance between any two foci was about 5 miles. The connection between the locations from which positive rats were taken from 315 South Broadway and 312 South Broadway will be dealt with later.

The diagnosis of plague in rats was made by group inoculations in six instances and by single inoculations in three instances. None of the rats which were proved to be positive showed lesions of acute plague. The lesions varied from those of subacute plague to those showing no gross signs. The causative organisms seemed to be attenuated in virulence and required a series of inoculations through guinea pigs in order to establish a diagnosis. The determination of each case was confirmed not only by animal inoculation but by cultural methods as well.

*Trapping operations.*—Trapping has been the most reliable procedure by which infected rodents were located and the amount of infection determined during the campaign. It furnished an index of the rodent population by species and has been largely responsible for the reduction of the rodents generally.

To trap properly an area of 420 square miles many factors had to be considered before a definite procedure could be outlined, namely, the limited trapping force, the large number of premises, and the extensive vacant territory, besides the migratory and other habits of rodents. It was therefore concluded that to locate and eradicate the infection it would be necessary to cover the territory as a whole and not in sections only.

Trappers were assigned to districts in numbers corresponding to the size and nature of the territory which had to be covered. They were divided into squads of six each, over which was placed a foreman. To each trapper the following property was issued: Two hundred snap traps, a few cage traps, a bucket, an oil can, a file, and a brush, for which property he was held responsible. Bread was used as bait and was supplied daily to the trappers.

The trapping force was so limited that it was impossible to assign men in sufficient numbers to each district to cover the city simultaneously. It was therefore necessary to move the trappers in rather definite lines, by progressively stepping the traps forward from one side of a district to the other, in order to be assured that no premises would be missed. The catch was collected daily and delivered to the laboratory for examination.

The number of trappers in the field varied from 183 on September 18, 1925, to about 25 at the end of the fiscal year. The trapping force was maintained at the highest point of efficiency at all times.

Each trapper was paid a salary of \$130 a month. No bounty could be offered as an incentive to insure a standard daily catch. A daily report card was used, whereby the efficiency of the individual could be determined.

*Rodent catch.*—A total of 255,720 rodents were collected during the fiscal year, as follows:



Total rodents collected.....	255,720
Total rats collected.....	96,657
Total squirrels collected.....	35,629
Total mice collected.....	123,434
Total rodents examined.....	106,936
Total rats examined.....	67,801
Total squirrels examined.....	34,208
Average daily rodent catch.....	849.5
Number of trapping days.....	301
Number of trapper days.....	34,340
Number of rodents per man per day.....	7.44
Number of rats and squirrels per man per day.....	3.85
Number of infected rodents (all <i>Mus norvegicus</i> ).....	12

The difference between the number of rodents collected and the number examined in the laboratory is accounted for by the fact that only a small percentage of mice were examined and the putrid, mutilated, and other rodents which could not be examined.

The wholesale and manufacturing district of the city, commonly spoken of as the commercial district, furnished a large proportion of the total rodents collected. With the advent of rat proofing and prompt compliance of the property owners to requests made of them the rat catch steadily declined until it was very low at the end of the fiscal year. Very few rodents, except mice, were taken from the commercial district during May and June, 1926. This section was once the most heavily infested portion of the city. The other sections of the city were not very heavily infested with rats, but had a large proportion of mice and miscellaneous rodents. The squirrel infestation was heavy in the open areas.

The ports of San Pedro and Wilmington were not very heavily infested with rodents. The rat catch from the ports has been consistently small during the fiscal year. However, the squirrel infestation in the open areas within the city limits, and especially adjoining the ports, has been very heavy throughout the year.

In the metropolitan district there existed a system of tunnels by which many large buildings were heated from one central heating plant and in which rodents could travel freely over long distances from one building to another. The tunnels were about 5 feet in height and 3 feet in width, through which steam pipes were run. There were at least 10 of the systems in an area of 1 square mile.

All of the tunnels were found to be infested with rats, and in the case of the Bradbury system one of the tunnels was proved to be the connecting link between two infested foci. From the Grand Central Market, the largest retail market in Los Angeles, located at 315 South Broadway, were taken several thousand rodents from the beginning of operations November 1, 1924, of which many were proved to be infected, the infection appearing periodically from February 22, 1925, to August 13, 1925.

On August 13, 1925, an infected rat was trapped in this location, which was the first infected focus located by the trappers working under the Public Health Service. Intensive trapping and other methods of plague control were immediately instituted in the market and adjoining blocks. The underground systems of tunnels were explored and all buildings connected with the central heating system were subjected to the same intensification of methods.

On August 22, 1925, an infected rat was trapped in a restaurant located in a building at 312 South Broadway, which is opposite the

Grand Central Market, across a wide, busy thoroughfare, but connected with it through the central heating system. The market had been a constant source of infected rodents from February 22, 1925, and not until all the buildings and tunnels on the Bradbury heating system were handled and treated as one infected focus was this dangerous situation eliminated. No infected rats were taken from any of the buildings, including the market, subsequent to the finding of infection on August 22, 1925.

*Wrecking.*—Wrecking was confined to immediate premises and adjoining properties from which infected or suspected rodents were taken. It has consisted in most instances of the removal of rat harborages only, that is to say, wood floors, double walls, and ceilings!

Many requests were received for the complete demolition of buildings, owing to a policy which had been established previous to the advent of the Public Health Service. A small percentage of the requests were granted. It has been found that the demolition of buildings in plague work is not a good policy. It is expensive, time consuming, and devoid of any great benefits.

During the acute stages of an epizootic the prime object of wrecking is the removal of rat harborages over wide areas around foci of infection, the elimination of potential harborages, and the collection of rodents which have not escaped from the area and which may have died of plague. The work should be very carefully supervised in order that it may be effective and at the same time economical.

In the city of Los Angeles 412,587 square yards of planking were removed from premises which had been potentially dangerous. All rubbish was taken away in trucks and each premise left in a safe condition. Approximately 1,400 truck loads of rubbish were removed, representing about 1,200,000 cubic feet.

*Poisoning.*—From June 1 until June 24, 1925, approximately 600,000 pieces of poisoned bait had been distributed in properties located in the commercial and semiindustrial districts of Los Angeles and along the banks of the Los Angeles River. Only 169 rats were found poisoned. The Public Health Service discontinued the use of poison on the latter date.

Poison should not be distributed during the acute stages of the epizootic. The use of biologic rat exterminators produces lesions in rodents similar to those of plague and the laboratory diagnosis is thus confused and made difficult. These substances should not be sanctioned because of the possibilities of food contamination. It is believed that the dissemination of infectious agents among rats is accompanied by danger to man. Trapping should be the chief method of locating plague-infected rodents, and should not be interfered with by the use of poisons of any nature. An objection to poison is also made on the ground that some rodents thus poisoned will die in locations which will prevent them from being collected and the chance of locating an infected focus may be missed. The general distribution of poison, if it is to be used in a plague campaign, should take place after the amount of infection has been determined and the infected area delineated. The value of chemical poisons as aids in exterminating rodents, however, should not be underestimated. Poisons are very useful in defective sewers, in rat-proof buildings subsequently infested, and for trap-shy rodents in all

localities. The measure should be employed several months before the termination of the work, with a view to reducing the residual rat population to a figure which, for lack of a better term, may be called the irreducible minimum.

From May 10, 1926, to the end of the fiscal year 24,230 pieces of poisoned bait were distributed in the same territory that had been previously poisoned, including all public and private dumps. The following rodents were collected: 140 *Mus norvegicus*, 104 *Mus alexandrinus*, 48 *Mus rattus*, and 113 *Mus musculus*, making a total of 405. Of the large number of poisoned baits which were carefully placed only 1,196 pieces had disappeared. While the number of rats thus killed and collected appears small, it may be safe to assume that a large percentage of the baits which disappeared would account, in each instance, for at least one rodent, as experiments have shown that only a small quantity is necessary in order to kill.

*Fumigation.*—Fumigation with hydrocyanic gas was used to a very limited extent, and only where there was no danger to human life. In a focus of infection located at 704 North Broadway, which had been fumigated with cyanide, there were collected approximately 60 rodents, some of which were proved to be plague infected. While cyanide gas has not been used routinely in Los Angeles, it is believed to be an excellent means in handling infected foci generally, and should be used wherever it is permissible to do so.

Carbon monoxide obtained from gases escaping from the exhaust of an automobile has been found to be very effective. The use of it was made available by a general connection fitted to a flexible pipe of rather large size and to the exhaust of an automobile. The gases were then forced through an opening made in wooden and concrete floors. In many instances a large number of rodents were collected, and in two foci thus treated rats were found which were positive for plague. It is believed that carbon-monoxide fumigation should be used in all instances before wrecking work is begun.

*Rat-proofing.*—Rat-proofing was begun during the month of August, 1925, after trapping, wrecking, and other emergency work had been well developed. Ordinance No. 50282, an emergency ordinance, which was passed by the city council on November 21, 1924, provided for rat-proofing in a general manner only, but did not embody specifications of rat-proofing as they might apply to the various types of buildings in the city of Los Angeles.

Regulations were drafted setting forth all of the principles of rat-proofing in detail, conforming closely to the ordinance published by the Public Health Service. They were submitted to the health commissioner of the city of Los Angeles for approval and adoption. The work was carried on under legal authority of regulations based on the above ordinance. This arrangement was not desired, but was the best that could be obtained under the circumstances, and there was a constant fear throughout the year of a constitutional test in the courts.

In order to institute a general rat-proofing campaign it was necessary to divide the various types of buildings into three major classes, namely, food depots, nonfood depots, and stables, each to be rat-proofed in a different manner. The food depots were required to have concrete floors, which were to be protected by a wall extending 18 inches into the ground and 12 inches above the floor. All open-

ings in the superstructure were to be closed in a manner so as to prevent the ingress or egress of rats. Nonfood depots were to be rat-proofed by constructing a continuous wall around the building extending 18 inches into the ground and upward beneath the floor. The wall was to be at least 6 inches in thickness and of a material impervious to rats. All openings in the superstructure to be handled in the same manner as in the food depots. Stables were required to have concrete floors and a protecting wall, special provisions for the protection of food, handling of manure, etc.

All property owners were served with notices calling their attention to the defects which existed on their properties and were notified as to the requirements for correction of the same. Thirty days were allowed in which to make the necessary changes. Upon completion of the work a formal abatement was issued and data were obtained relative to cost. A fine spirit of cooperation was maintained throughout the year.

Particular attention was given to the business places, food depots, and nonfood depots, and to residences in the commercial, the metropolitan, and the old congested sections of the city. Very few notices were served on other residential properties. Court proceedings were found to be unnecessary.

*Summary of the rat-proofing work*

Number of inspections .....	34, 104
Number of reinspections .....	101, 305
Number of notices served .....	27, 262
Number of abatements issued .....	15, 596
Number of food depots (concrete floors) .....	3, 050
Number of nonfood depots (continuous wall) .....	3, 011
Number of nonfood depots (by elevation) .....	726
Number of food depots and nonfood depots (by minor repairs) ..	8, 809
Number of square yards of concrete .....	415, 653
Number of linear feet of chain wall .....	723, 661
Total cost .....	\$2, 619, 146. 27
By concrete floors .....	\$968, 789. 63
By continuous wall, elevation, and minor repairs .....	\$1, 650, 356. 64

The above totals do not include the amount of rat-proofing on premises which had complied, in part only, to notices served; nor does it take into consideration the amount of rat-proofing which had been done on premises on which no notices were served. Rat-proofing in new constructions is not included. It is estimated that the total expenditure by the property owners in the city of Los Angeles would exceed \$3,000,000 if the full records were available of the amount of rat-proofing that has been accomplished.

It may be stated that the premises was the unit for issuing abatements in the campaign. In many instances from six to ten nuisances existed and were corrected on the property before an abatement was issued. No records were kept of the number of the minor nuisances corrected.

*Ground-squirrel extermination.*—No effective method of squirrel extermination has as yet been devised. The distribution of poisoned grain, shooting, and the use of carbon disulphide in burrows were the means employed during the course of the work. Although many thousands were destroyed and large tracts of land apparently cleared of the pests, observation showed that they reappeared in the course of a month or two.



The question arises as to whether reinfestation occurred through migrations from distant centers or whether the animals subsequently observed were not survivors of the original colony. The amazing fecundity of the *Citellus* is also a factor that must be considered in connection with this phase of the problem. Data recorded during a period of six months showed that the total number of fetuses of females dissected in the laboratory equaled the total number of squirrels collected—the females representing about 53 per cent of the number. The same rule held true of the rats examined.

There can be no doubt that the habit of estivating, or hibernating, for long periods greatly increases the difficulty of exterminating squirrels by means of gases and other poisons, because the animal when in a state of torpor requires little oxygen and no food or water. It is believed that estivation can be assumed at will as a means of defense against adverse conditions which arise from time to time in the struggle for existence.

The employment of a more lethal substance, such as hydrocyanic gas, would give better results, and an effort should be made to find a safe method of preparing and applying it. At any rate, the choice of a gaseous exterminator should be made in accordance with the habits of the animal and with a view to asphyxiating its parasites as well. Neglect of the latter precaution could well be the cause of the continuance of epizootic infection.

Good results have been reported by the State horticultural commission following the use of poisoned grain and other methods in various counties. The recurrence of epizootic plague, however, indicated that either infected squirrels or infected fleas survived the operations and lived long enough to spread infection to succeeding generations.

Monthly summary of squirrels examined in laboratory between July 1, 1925, and June 30, 1926

Month	Total	Males	Females	Per cent males	Per cent females	Pregnant females	Per cent pregnant females	Total number of foeti	Average number of foeti
1925									
July.....	3,932	1,979	1,953	50.3	49.7	31	1.58	267	8.61
August.....	2,931	1,437	1,494	49.0	51	14	0.937	112	8.0
September.....	2,919	1,372	1,547			4	.25	30	7.5
October.....	2,336	1,098	1,238			3	.24	25	8.33
November.....	1,257	591	666			1	.15	7	7.0
December.....	1,698	798	900	47.0	53	71	8.00	575	8.09
1926									
January.....	3,100	1,457	1,643			560	34.1	5,215	9.31
February.....	2,601	1,222	1,379			655	47.5	5,458	8.33
March.....	3,601	1,625	1,976	45.1	54.9	1,389	70.29	12,003	8.64
April.....	2,626	1,145	1,481	43.6	56.4	746	50.37	5,785	7.75
May.....	2,727	1,292	1,435	47.3	52.7	492	34.28	3,328	6.76
June.....	4,480	2,123	2,357	47.4	52.6	267	11.32	1,867	6.99
Total.....	34,208	16,139	18,069	47.0	53.0	4,233	23.4	34,672	( <sup>2</sup> )

<sup>1</sup> During the months from Sept. 1, 1925, to Feb. 28, 1926, records of sex were not kept in the laboratory and the figures as represented above were calculated on the basis of 53 per cent females and 47 per cent males, which was arrived at by the ratio of females to males for the months of July and August, 1925, and March, April, May, and June, 1926.

<sup>2</sup> Total brought in by hunters, 35,629; total examined in laboratory, 34,208. The difference of 1,421 represents number of squirrels which, due to laceration and rapid decomposition, were unfit for examination and dissection.

<sup>3</sup> Mean average, 7.94; average from totals, 8.42. Maximum number during year, 15; minimum, 4.

*Cooperation with the city department of health.*—For the fiscal year ended June 30, 1926, the city of Los Angeles appropriated \$325,000; the Federal Government allotted \$120,000, not including the salaries of commissioned officers. It was necessary to make arrangements with the health commissioner for a liaison officer so that amicable relations could be established and expenditures made in conformity with existing laws. By effecting this arrangement assistance was rendered in securing personnel and furnishing transportation and supplies, the latter being purchased through the city health department. Ample transportation was available throughout the year, and no trouble was experienced in securing supplies.

Dr. George Parrish, the health commissioner, and his department were active in the matter of securing favorable sentiment, better legislation, and appropriations. They were untiring in their efforts to secure the cooperation of the various departments of the city government, which was necessary to insure the success of the campaign.

The service also appreciated the cooperation rendered by Mr. James Woods, chairman of the health and sanitation committee of the chamber of commerce, who gave a great deal of his time to committee meetings and to other efforts to secure the support of the general public.

*Smallpox.*—A smallpox epidemic of considerable proportions occurred during the course of the campaign. It began in October or November, 1925, and reached its highest stage in February, 1926. The outbreak was not confined to any one section, but was widely scattered throughout the city. More than 1,278 cases were reported, with 200 deaths. Of the cases treated in the hospital 50 per cent were of the confluent or hemorrhagic types.

Upon the request of the health commissioner an officer was detailed to assist in vaccinating school children and in rendering such other aid as his duties would permit. It is stated in the health commissioner's report that "less than 20 per cent of the patients came from the foreign population, including the Mexicans."

#### ATTITUDE OF THE STATE AND COUNTY BOARDS OF HEALTH

Early in July, 1925, a communication was addressed to the president of the State board of health informing him that the Public Health Service had assumed charge of plague eradication measures in Los Angeles upon the request of the city administration and suggesting a conference for the purpose of considering a definite plan of cooperation between the authorities concerned. In his reply, dated July 9, 1925, the president accepted the offer of cooperation and stated that a conference would be called at an early date in Los Angeles.

This meeting was held in the State board's headquarters in Los Angeles July 13, 1925, and was attended by the State and county health officers and Assistant Surgeon General Blue and Surgeon White, of the Public Health Service. Definite proposals were made by Doctor Blue for a joint investigation of conditions in Los Angeles and adjoining counties, with a view to delineating infected areas that might have escaped detection during the first survey or which might have been reinfected through subsequent migrations of infected

rodents from Los Angeles. It was pointed out that the defense of Los Angeles against plague was dependent more or less upon rodent infestation of adjoining towns and rural districts. During the course of the conference the county health officer seemed inclined to accept the suggestion, but stated that the policy of his board would be in this instance defined by the State board of health. The State health officer withheld his decision and announced that the matter would be brought to the attention of his board for consideration and action. No answer has as yet been received from the State health officer relative to the proposals discussed at that time.

Following the conference a letter was forwarded to the president of the State board expressing regret at the failure of the conference to recommend a cooperative plan whereby the two services could work toward a common end. No satisfactory explanation of the State's attitude on this important matter has ever been given. The board had no funds for antiplague work and had been forced to request an additional appropriation of \$500,000 from the city with which to defray the cost of operations. In April, 1925, the city council instructed the health commissioner to demand control of the municipal "rodent-extermination division" from the State on grounds which it deemed to be just and proper. This letter was unanswered. However, upon the receipt of a second request, dated June 1, 1925, the State withdrew, leaving the situation in the hands of the local department of health.

Although it was generally known that infected foci existed in Los Angeles, the county authorities discontinued plague-suppressive measures on July 1, 1925, regardless of the fact that large numbers of rats could still be trapped on the refuse dumps maintained by some of the incorporated towns. Hermosa Beach is a conspicuous example of this type of community. Trappers who visited these dumps at irregular intervals secured in each instance large catches of Norway rats. It is of interest to note that some of the Hermosa rats exhibited plague-like lesions from which an unidentified organism was isolated.

Complete monthly reports covering the operations of the Public Health Service in Los Angeles were forwarded to the State board of health from the inception to the completion of the work. The finding of plague-infected rodents was reported by letter immediately following laboratory confirmation, the date, location, and numbers being given so that a spot map of foci could be prepared from the information supplied.

The facilities of the plague laboratory at 1015 East Eighth Street for purposes of instruction were placed at the disposal of the State and county boards. Assistants in the county health offices of Orange, Ventura, and Riverside Counties, and the city of Long Beach visited the laboratory and received instruction in methods of determining plague in rodents, etc.

*Recommendations.*—Under date of June 14 a communication was addressed to the health commissioner stating that the service would withdraw on June 30, 1926, and emphasizing the importance of continuing certain antiplague measures indefinitely in order to prevent a recurrence of the disease in Los Angeles. The activities recommended were as follows: (1) That trapping operations and labora-

tory examination of rodents be continued as routine measures; (2) that the building code be amended in such way as to provide for rat-proof construction; (3) that provision be made (under general police power) for the elimination of rat harborages and rat colonies wherever found; (4) that antirat installations be considered a sanitary prerequisite in granting permits for the conduct of business places; (5) that a modern system of refuse collection and waste disposal be installed; (6) that an arrangement be made with the county authorities whereby similar measures will be enforced in the towns and communities with which Los Angeles is connected.

A copy of this letter was forwarded to the chairman of the health and sanitation committee of the chamber of commerce so that members of the chamber might inform themselves concerning the plague situation in southern California. It was pointed out that the method of refuse disposal obtaining at that time was far from satisfactory; in fact, that it was an insanitary anachronism that should be condemned at once and replaced by a modern system. Kitchen refuse, market waste, and street sweepings constitute the chief food supply of the rat population; the greater the supply the more numerous the rats. Refuse should be collected at frequent intervals and destroyed by incineration or by a combination of methods by which the health menace would be removed, and portions of the material separated and utilized. It should be borne in mind that no system is complete or safe that does not provide for the use (in each household) of metal garbage cans with tight-fitting covers.

#### PLAGUE IN OAKLAND

The conditions under which plague suppressive measures were inaugurated and conducted in the transbay cities in 1925 were fully described in the annual report for that year. The activities were continued during the current fiscal year until March 1, 1926, at which time they were terminated. The last plague-infected rat in the campaign was captured on March 2, 1925. The total number of plague-infected rats captured was 21. The total number of rats trapped during the entire campaign, January 1, 1925, to March 1, 1926, was 81,755, of which 72,074 were *Mus norvegicus*; 1,139 *Mus alexandrinus*; 1,226 *Mus rattus*; the remainder were unclassified. The maximum weekly rat catch was 3,123 and was made in the week ended March 21, 1925; thereafter the catch steadily declined. In March, 1925, the trapping average per man per day was  $6\frac{1}{5}$  rats, whereas in January, 1926, it had declined to  $3\frac{1}{5}$  rats. It is believed that the rat population of Oakland has been reduced by at least 50 per cent in the course of the campaign.

The custom of disposing of garbage by dumping along the water front gave rise to a large number of rats and favored the spread of plague infection among rodents. Until these dumps could be thoroughly cleaned up and a more satisfactory method of garbage disposal inaugurated there was no assurance that plague would not recur. During the current fiscal year the dumps were entirely eliminated and two scows were obtained by the city and are now used in carrying garbage to sea, where it is dumped some 40 miles from land. This method appears to be entirely satisfactory. The



old garbage dumps have been eliminated partly by fire and partly by covering with sand.

Further acknowledgment is made to the various officials and the city governments in the east bay communities for their cordial co-operation which was maintained from beginning to end throughout the campaign and which made it possible to obtain satisfactory results.

PLAGUE SUPPRESSIVE MEASURES IN CITIES AND COUNTIES IN VICINITY OF  
SAN FRANCISCO BAY

In this report consideration will be given only to those activities carried out in the city and county of San Francisco, San Mateo, Alameda, and Contra Costa Counties.

The plan of these activities has been similar to that in past years and will be considered under the following headings:

- (a) Plague in ground squirrels and rodent-control measures.
- (b) Rodent surveys and sanitary inspections in San Francisco.
- (c) Operations of the Public Health Service laboratory.

*Plague in ground squirrels.*—There is believed to be no change in the status of plague infection in ground squirrels, and it is probable that shooting operations carried out for the purpose of determining the foci of infection would demonstrate that this disease continues to exist over a large section of California, extending from the Carquinez Straits on the north to Los Angeles County on the south, and embracing the central and coast counties in this area.

There have been deaths from plague among the ground squirrels in San Luis Obispo County, and one infected rat was found in this area, the infection probably having been acquired from contact with infected squirrels.

Plague has been definitely proved in ground squirrels in San Benito County. Out of 27 forwarded from an area in the southern part of that county, 5 were found infected with plague. Plague infection has been continuous in this particular area, as one human case occurred in 1920 and another in 1921. Report has also been received that a child in this same locality was taken sick with a high fever and enlargement of the glands in the axilla. This in all probability was a mild case of bubonic plague that recovered.

It has not been possible to carry out any shooting operations during the year on account of the limited appropriation available for this work. The State has been unable to contribute any financial aid for these operations and the allotment was sufficient only to permit carrying on the work in the four counties in which control measures are being exercised.

The continued existence of numerous foci of plague in ground squirrels over a large area in the State of California constitutes a perpetual menace to public health. It will never be eradicated under the present methods of operation, because they are not extensive enough to make a definite impression toward eradication of these foci of infection.

*Field operations for control of ground squirrels.*—The activities directed toward the control of ground squirrels have been limited to the four counties in which work was contracted in 1921. It was believed that the funds available could be most advantageously ex-

pending in limiting the work of control measures to the districts around centers of population in the bay region for the purpose of maintaining a squirrel-free zone. In two of these counties the employees of this office have operated in conjunction with the employees of the county horticultural commissioner, the agency in charge of county control measures.

In addition to the activities of this office, limited operations are being carried out in some of the other counties by the horticultural commissioner. These measures, however, are not always continuous and effect little more than nominal control. The amount of work performed varies in different counties, and in the majority practically nothing is being done.

If plague infection is ever eradicated in the ground squirrels of California, it will be accomplished only by an intensive, coordinated effort, covering the entire area known to have foci of infection over a period of at least three years. Active shooting operations to determine foci of infection and active eradication measures in and around these foci would eventually eradicate the disease. Work of this magnitude would require a large appropriation, and unless such appropriation be made available by the State or county authorities the present situation will probably continue or grow more menacing.

The field operations were as follows:

Number of inspections.....	23
Number of reinspections.....	5,653
Number of acres inspected.....	4,031
Number of acres reinspected.....	1,862,507
Number of acres treated with waste balls.....	67,514
Number of acres treated with grain.....	252,010
Number of holes treated with carbon bisulphide.....	389,122
Material used:	
Number of pounds of poisoned grain.....	134,652
Number of gallons of carbon bisulphide.....	6,743
Number of waste balls used.....	391,257
Number of pounds of poisoned barley mixed for private landowners under supervision of employees of the service.....	61,609
Experimental work with calcium cyanide:	
Acres of land treated.....	185
Number of burrows treated.....	300
Pounds of calcium cyanide used.....	137½

A further use has been made of calcium cyanide in selected areas for the purpose of determining efficiency, in comparison with carbon bisulphide, in the destruction of squirrels, as the two agents are used under similar conditions. The use of this material by open-hole method has not been proved as efficient as when the opening of the burrow has been closed. In event the latter is required, the calcium cyanide is as expensive as carbon bisulphide, without being as valuable a destructive agent.

*Measures taken against rats.*—A rodent survey has been continued in San Francisco during the year, and there have been employed six trappers, four engaged by the city and two Federal employees. The work, at the request of the city health officer, has been carried out by this office, and the rats caught are examined in the Public Health Service laboratory here. During the year there have been approximately 1,500 traps in continuous operation, and the number of rats caught was 36,839. The trapping operations have been most successful, and this survey has been maintained at a cost of about \$7,000 to the city and the salary of two Federal employees.

In addition to trapping, limited poisoning operations were carried out for the purpose of treating vacant lots, lumber piles, etc.; 111,200 baits were placed.

The classification of the rats has been transferred in this report to the section on the operation of the laboratory. It will be noted that a proportionately large number of *Mus alexandrinus* and *Mus rattus* have been trapped. These, when compared with the percentage of the same species trapped in Oakland, will give an indication of the more satisfactory rat-proof conditions in San Francisco against *Mus norvegicus*.

San Francisco probably has a larger percentage of rat-proof buildings than any other seaport in the country. This is largely due to the extensive campaign of 1907 and 1908 and the continuous operations since that period for the condemnation and rat proofing of infested harborages and insanitary premises. These activities are shown below:

Number of premises inspected.....	16,325
Number of nuisances abated.....	2,663
Number of complaints investigated.....	1,628
Number of garbage cans installed.....	1,348
Number of premises cleaned of rubbish.....	458
Number of floors torn up.....	322
Number of buildings destroyed.....	130
Number of stables destroyed.....	7
Measures taken for the permanent rat proofing of old buildings, including food places:	
Number of buildings rat proofed by concreting.....	335
Basements concreted (square feet, 45,700).....	23
Floors concreted (square feet, 533,665).....	312
Yards, passageways, sidewalks, etc., concreted (square feet, 1,580).....	3
Total area concrete laid.....square feet.....	580,950
Total area walls installed.....do.....	8,380
Number floors rat proofed with double floors and wire cloth between (square feet, 29,250).....	18

*Sanitary inspections in San Francisco.*—The sanitary inspections in San Francisco are of complaints referred from the city health department and from other sources.

Rat complaints.....	905
Chicken, rabbit, pigeon, etc., complaints.....	155
Garbage and defective garbage cans.....	80
Rubbish complaints.....	52
Plumbing complaints.....	3
Insanitary premises, including shacks.....	176
Stench complaints.....	6
Goat, dog, and cat complaints.....	3
Mosquito, fly, and flea complaints.....	5
Miscellaneous.....	243

NOTE.—All the above complaints were investigated by the inspectors, the necessary notices prepared and sent out, and reinspections made to determine whether the existing nuisances were abated.

#### Condemnation proceedings

Number of buildings submitted to board of health for condemnation.....	145
Number of buildings acted on by board of health and condemned.....	95
Number of buildings acted on by board of health and not condemned.....	<sup>11</sup> 50
Number of buildings abated following condemnation proceedings (by repair, 1; by demolition, 118).....	119
Number of buildings condemned and remaining unabated.....	107

<sup>11</sup> These include some buildings acted upon during previous years; hence totals will not balance.

*Operations of Public Health Service laboratory in San Francisco.*—The policies of the laboratory and the general scope of its activities have been continuous with those practiced in former years, involving the examination of rodents to determine the presence of plague, clinical-microscopical examinations requiring facilities not immediately available to other stations of the service and to other governmental departments, and the investigation of the diseases of man.

The examination of rats collected in Oakland, Calif., under the supervision of the service was continued until March, 1926, and subsequently a smaller number collected daily by the Oakland Board of Health has been examined without the finding of plague infection. The examination of ground squirrels collected from the immediate environs of Oakland was also made without the finding of plague infection.

The examination of rats collected in San Francisco, under the supervision of the service, has been continued throughout the year without the finding of plague infection.

A few ground squirrels were submitted for examination by the county horticultural forces of San Benito County, and in one shipment of 27 collected from the southern end of the county, 5 were found to be plague infected. Of these, 1 was in a subacute stage of infection and 1 in an acute septicemic stage.

Clinical-microscopical, bacteriological, or serological examinations were made for the United States marine hospital and relief stations at San Francisco and San Pedro and for the immigration and the quarantine stations at San Francisco, and active clinical assistance was rendered the United States marine hospital at San Francisco during an acute outbreak of smallpox, and bacteriological examinations of water were made for the United States Veterans' Bureau and for the United States Lighthouse Service.

Cooperative experimental investigations were made with the plague laboratory of the service at Los Angeles, Calif., in determining the presence of infections in rats with bacterium tularensis.

The courtesy of the laboratory and active assistance have been extended the Hooper Memorial Foundation and field material has been supplied in investigations to determine the prevalence in rats of bacteria of the typhoid group and to determine the identification and classification of other bacteria-producing lesions in rats which resembled those of plague. Similarly aid was given in studies being made in the department of zoology of the University of California by making observations and compiling data on the breeding season of Norway rats in San Francisco. The personnel of the laboratory has also delivered lectures to the students in public hygiene of the University of California and has made addresses to local county medical societies and to a scientific society on epidemic work conducted by the service.

Experimental investigations have been made in the methods of immunizing against smallpox, in which approximately 500 tests were made, and a local outbreak of the disease was studied and reported. Also investigations are being conducted with strains of *B. pestis* collected from tarbagans, ground squirrels, and rats to determine their probable relationship to the production of plague pneumonia in guinea pigs, and observations on rat leprosy are being



made in the attempt to establish the infection in white rats and to determine the constancy of leprosylike bacteria in the nose of the wild Norway rat.

Studies in the development of the clonorchiasis have been continued along the lines elsewhere reported.

*Classification of rats*

Rats from San Francisco:		Rats from east bay cities:	
Mus norvegicus	28,209	Mus norvegicus	26,824
Mus rattus	3,576	Mus rattus	633
Mus alexandrinus	5,054	Mus alexandrinus	744
Total	36,839	Total	28,201

*Summary of laboratory operations*

Examination of rodents for plague:	Received	Examined
Rats from San Francisco	36,839	32,313
Rats from Oakland, Alameda, and Berkeley	28,201	26,501
Rats from fumigated ships	1,893	1,893
Mice from Oakland, Alameda, and Berkeley	1,201	1,201
Ground squirrels	2,702	2,702
Total number rodents examined	70,837	64,611
Serological examinations:		
Wassermann reactions		3,249
Widal tests		12
Total		3,261
Bacteriological examinations (cultures and microscopic):		
Blood		12
Feces		6
Urine		1
Throat cultures		2
Other body fluids		9
Suture material		34
Water examinations		2
Total		66
Bacteriological examinations with animal inoculations:		
Tuberculosis		15
Rodent plague		105
Total		120
Squirrels, positive for plague		5
Parasitological examinations		1
Histological examinations		88
Vaccines		2

PLAGUE ERADICATIVE MEASURES IN NEW ORLEANS, LA.

The rodent survey with which this report is concerned was begun in New Orleans in December, 1924, following the recognition of rodent plague in rats trapped along the water front during the latter part of November, 1924. Between December 2, 1924, and January 17, 1925, 12 rats were found to be plague-infected. No other infection was demonstrated, though 156,000 rats were examined. During the period covered by this report the work was in charge of Surg. C. V. Akin.

The trapping and examination of rats and the fumigation and fending off and rat guarding of vessels was actively prosecuted throughout the fiscal year ended June 30, 1925.

#### A TRAPPING OPERATIONS

*Trapping force*.—Effective the close of work on June 30, 1925, the trapping force which had been maintained at an average of 135 men was reduced to 85. The plan of squad districts originally instituted was adhered to. One acting inspector; 2 chief trappers, and 10 foremen supervised and directed the activities of 70 trappers distributed in 10 squads.

*Trapping area*.—With the reduction in force the area covered by trapping operations was necessarily restricted, though the manner in which this was accomplished was designed to maintain the catch at the highest possible point. Incoming vessels, water front and wharves, and all known rat-plague foci were provided for and intensive trapping was assured throughout the zone lying between the river and St. Charles Avenue above Canal Street and the river and Claiborne Avenue below Canal Street. Traps were entirely withdrawn from certain areas which had yielded small catches for long periods and trappers were not kept in districts yielding less than three rats per man per day for longer than one week.

*Rodent catch*.—During the period covered by this report, July 1, 1925, to September 30, 1925, there were 75 trapping days. A total of 63,346 rodents were trapped, fumigated, and found dead, of which number 38,707 rats were examined in the laboratory.

A comparison of the total catch with the number of trapping days utilized shows the following daily averages:

Total rodents captured.....	63,346	Average daily rodent catch.....	844.6
Total rats examined.....	38,707	Average daily rat catch.....	516.0
Trapping days.....	75	Rodents per man per day.....	11.9
Trappers (daily average).....	71	Rats per man per day.....	7.2

#### B. LABORATORY OPERATIONS

*Laboratory*.—All rats were examined in the "rodent-plague laboratory" under the direction of Dr. W. H. Seeman, bacteriologist for the State and city boards of health.

There were no changes in procedure or personnel in the laboratory during the period under consideration.

*Examination of rats*.—Of a total of 38,707 rats examined, 233, or 0.6 per cent, were considered suspicious for plague. None of these, however, proved positive on biologic test.

#### Distribution of rats examined by species and sex

Species	Male	Per cent	Female	Per cent	Total	Per cent
M. norvegicus.....	16,863	48.6	17,839	51.4	34,702	89.7
M. rattus.....	641	42.9	856	57.1	1,497	3.9
M. alexandrinus.....	1,123	44.8	1,385	55.2	2,508	6.4
Total.....	18,627	48.2	20,080	51.8	38,707	100.0

*Plague rats.*—By the conclusion of the survey on September 30, 1925, approximately eight and one-half months had elapsed since the reporting of the last plague-infected rat on January 17, 1925. This observation is of the greatest significance when considered together with the fact that during this time 156,000 rats were carefully examined by inspection, smear, culture, and inoculation.

#### C. OUTGOING QUARANTINE

During the fiscal year ended June 30, 1925, three phases of outgoing quarantine procedure were prosecuted. Throughout the period from December, 1924, to June 30, 1925, all vessels entering and docking in the port of New Orleans were required to fend off and rat guard, but successive modifications of the fumigation requirements applicable to vessels because of the presence of rodent plague in New Orleans were recommended to and approved by the bureau as the time interval after the finding of the last plague-infected rat on January 17, 1925, increased.

Effective July 1, 1925, coastwise vessels docking in New Orleans were required to fumigate under Public Health Service supervision only once in 90 days.

On July 18, 1925, six months after the notification of the last infected rat, the Public Health Service officially declared New Orleans to be free from rodent plague, and all restrictions incident thereto were removed.

*Fumigation of vessels.*—The quarantine fumigation plant, under the immediate supervision of Acting Asst. Surg. R. E. Bodet, transferred from the jurisdiction of the New Orleans quarantine station to that of plague-eradication measures on December 10, 1924, remained on the latter temporary status until late in September, when it became definitely established that the rodent-plague survey and eradication measures would be discontinued, effective September 30, 1925, if no other infection should be demonstrated.

The agreement with the New Orleans Steamship Association, entered into on January 1, 1925, by which certain necessary fumigating personnel would be furnished and stipulated expenses for motor transportation upkeep and operation met by that organization, was kept in effect until September 30, 1925. This action, taken in the face of the fact that the actual fumigation demands diminished rapidly after the opening of the port, is typical of the generous and whole-hearted cooperation constantly displayed by the association.

*Fumigating personnel.*—In addition to the service personnel regularly assigned to New Orleans, consisting of 1 medical officer, 1 chief fumigator, and 7 assistant fumigators, 14 additional fumigators furnished by the steamship association were retained on duty until June 30, 1925. Effective July 1, 1925, 4 association fumigators were discontinued as a means of equalizing expense, in view of the fact that fewer vessels were being entered for fumigation under the 90-day modification.

The association fumigating force was further decreased on August 15, 1925, when 6 additional men were discontinued. This reduction was accomplished with no loss in efficiency, as the complete removal of plague restrictions on July 18, 1925, made fumigation necessary

only for such vessels as entered New Orleans subject to the terms of a provisional pratique.

At the solicitation of the medical officer in charge, the steamship association agreed to the retention of the remaining 4 fumigators pending action by the bureau on a recommendation that the regular service fumigating force be increased by 4 additional men. This recommendation was approved, and, effective October 1, 1925, the New Orleans fumigating organization consisted of 1 medical officer and 12 men, which number provides two independent fumigating squads, thus doubling the capacity of the plant.

*Vessels fumigated.*—From July 1 to September 30, 1925, 122 vessels were fumigated with hydrocyanic-acid gas by the barrel method. This represents a daily average of 1.3 vessels, or one-third of the average established for the period December 16, 1924, to June 30, 1925, during which time the peak load incident to the actual presence of plague was experienced.

It should be stated that "averages" in this connection are misleading, as they in no wise typify the daily peak so often encountered. In the production of an average of 1.3 vessels days showing four fumigations are included as well as days on which no fumigations were done. If fumigation is to be accomplished without seriously interfering with shipping, it is obvious that a fumigating organization must be maintained calculated to meet the ordinary peak load without undue strain.

The average cost of fumigation per vessel was approximately \$70, the amount established during the rush period December 1924–June, 1925.

#### D. PORT SANITARY REGULATIONS

The requirements of paragraphs Nos. 101 and 102 of the United States Quarantine Laws and Regulations relating to the fending off and rat guarding of vessels entering and docking in a plague-infected port were enforced rigidly until New Orleans was declared to be plague free on July 18, 1925.

The force of water-front inspectors detailed to secure compliance was then reduced to one, whose activity was limited to the inspection of vessels entering New Orleans subject to the terms of a provisional pratique.

During the period of three months ended September 30, 1925, 944 vessels were inspected 2,217 times. Six hundred and seventy-seven of these vessels required port sanitary statements, necessitating the issuance of 1,544 statements for additional ports of call. Of this list only eight vessels, through failure to comply with port sanitary regulations, were given "foul" bills of health.

#### E. TRANSPORTATION

Adequate transportation facilities were afforded by the several agencies cooperating in the survey. Heavy motor trucks were furnished by the Public Health Service for fumigation duty. Light motor trucks were furnished to the fumigating plant by the New Orleans Steamship Association, and mechanical upkeep and repair and a considerable proportion of the fuel and lubricating material used were also provided by the association. The New Orleans city



board of health furnished and maintained two light touring cars throughout the survey, one being assigned to the trapping organization and one to general headquarters use. The State board of health furnished one light touring car for headquarters use.

The collection and transportation of the rodent catch from the widely separated squad district centers was accomplished easily with a small truck. After passing through the laboratory, rodents were removed to a city incinerator in this same truck.

## F. FINANCIAL

Aside from the financial support given to the fumigation section by the New Orleans Steamship Association, the expenses of the rodent plague survey for July, August, and September, 1925, were met by the Public Health Service and the New Orleans city board of health. The amounts expended were as follows:

(1) *United States Public Health Service.*—

(a) Salaries.....	\$27,551.06
(b) Rat bounty.....	4,180.20
(c) Miscellaneous.....	30.00
Total.....	31,761.26

(2) *New Orleans city board of health.*—In addition to the rodent plague laboratory which was operated entirely at city expense, the city board of health provided a monthly allowance of \$1,800. As this allowance was accumulative, rigid economy resulted in an unexpended balance of \$5,687.79 in the rodent plague survey fund on September 30, 1925. The expenditures for the period July, August, and September, 1925, totaled \$4,099.82.

Grand total of all expenses of above agencies was \$35,861.08.

## G. COST OF RODENTS TRAPPED AND EXAMINED

NOTE.—In order to establish with a high degree of accuracy the actual cost per rat, every item of expense incurred for all purposes of the survey has been added, including the salary of the medical officer in charge.

## (1) Cost per rodent, including rats and mice:

Total rodents trapped.....	63,346
Total cost of survey.....	\$35,861.08
Cost per rodent trapped.....	0.566

As compared with the cost per rodent for the period December, 1924, to June 30, 1925, the above figure shows a decrease in operating cost of \$0.065 per rodent.

## (2) Cost per rat delivered at laboratory for examination:

Total rats examined in laboratory.....	38,707
Total cost of survey.....	\$35,861.08
Cost per rodent examined.....	0.926

As compared with the cost per rat examined during the period December, 1924, to June 30, 1925, the above figure shows a decrease in operating cost of \$0.016 per rat.

## H. SUMMARY

1. The last plague-infected rat in New Orleans was reported on January 17, 1925.

2. Between the reporting of the last plague-infected rat and the discontinuation of the survey on September 30, 1925, a total of 155,753 rats were examined, with negative results.

3. The port of New Orleans was officially declared plague free six months after the finding of the last plague-infected rat.

4. Trapping operations and the laboratory examination of rats were actively prosecuted for two and one-half months after the opening of the port, during which time approximately 35,000 rats were examined, with negative results.

5. The ratio between rats examined (174,187) and plague-infected rats recognized (12) gives 1 plague rat for every 14,515 rats examined.

6. From December 2, 1924, to January 17, 1925, 12 plague-infected rats were demonstrated. These rats were captured in 7 apparently separate foci, 3 on or immediately adjacent to the water front, and 4 inland.

*Water-front foci.*—Water-front focus No. 1 is represented by several sublocations extending over a wharf area of from three-fourths to 1 mile from Conti to Piety Streets. Six plague-infected rats were recovered from this area within about six weeks.

Water-front focus No. 2 at the Washington Avenue level is located 4 miles upstream from No. 1.

Water-front focus No. 3, at Stuyvesant Docks, Elevator E, foot of General Taylor Street, is in turn 1 mile upstream from No. 2.

*Inland foci.*—These foci are listed in the order of the date when infection was reported.

Inland focus No. 1 (plague rat No. 6) is located approximately 2 miles inland, at 2010 Sixth Street. This location represents the apex of a triangle, the basal angles of which lie at water-front foci Nos. 2 and 3.

Inland focus No. 2 (plague rat No. 7) is located about one-half mile inland and approximately midway between water-front foci Nos. 1 and 2.

Inland focus No. 3 (plague rat No. 11) is located from one-half to three-fourths mile inland and approximately midway between water-front foci Nos. 2 and 3.

Inland focus No. 4 (plague rat No. 12), at 1703 Religious Street, is located from one-fourth to one-half mile inland and without special reference to water-front foci, except that it is nearest to water-front focus No. 2.

7. Careful estimates, in which all items of expense have been included, indicate that the New Orleans rodent plague survey was conducted at a cost of slightly less than \$0.95 per rat.

#### SURMISES AND CONCLUSIONS

(1) While it is impossible to conclude definitely from the experience of the survey under consideration whether this, the latest occurrence of rodent plague in New Orleans, was a recrudescence or a reimplantation, it is believed that the latter position is the more tenable. With the exception of inland focus No. 1 (rat No. 6, 2010 Sixth Street), the 11 remaining infections were on the water front or within striking distance of the wharves. For the purposes of this discussion it may be assumed that if the occurrence of rodent plague in this instance was a *recrudescence* infection would have been (a) more widespread, (b) less definitely associated with one zone or section of the 40 square miles of area under survey, and (c) the plague infections demonstrated would have been less apt to be concentrated

within the comparatively brief period of two months (first plague-infected rodent captured November 22, 1924, positive December 2, 1924; twelfth plague-infected rodent captured January 15, 1925, positive January 17, 1925). The ratio between the total number of rats examined and the square miles of territory trapped shows an average of 4,355 rats per square mile.

(2) As regards the mechanism of reimplantation or the specific source of infection, it is possible only to advance general conclusions. Infected rats captured on and immediately adjacent to the water front were taken over a stretch of 6 miles. Along this front vessels from foreign ports dock and discharge cargo. Pursuant to the requirements of paragraphs 101 and 102 of the Quarantine Laws and Regulations, such vessels discharge cargo *prior to fumigation*. Whether these vessels fend off and rat guard during discharge appears to be of no great consequence so long as the fact is established that cargo which may or may not carry plague-infected rats is conveyed to the docks. From the date of the discontinuation of plague-eradication measures on June 30, 1923, to December, 1924, when plague was again discovered, vessels from known or suspected plague ports arriving in New Orleans followed the procedure suggested above.

(3) In attempting to establish the probable time of reimplantation it may be assumed that the reinfection was of comparatively recent date. This conclusion is based on the fact that 11 out of 12 infected rats were captured on or very near the water front and the ratio of infection to total rats examined was 1 to 14,517.

(4) It is not believed that the plague infection under consideration can be attributed to contamination of shore rats by the known infected rats on the steamship *Atlanticos*, arriving in New Orleans on October 27, 1924, and the steamship *Craftsman*, arriving on November 12, 1925.

(a) Neither vessel docked at all of the wharves on or near where plague-infected rats were subsequently found.

(b) The time interval between the docking and discharge of these vessels, October 27 and November 22, 1924, respectively, and the appearance of plague infection in rats on the New Orleans water front from November 22, 1924, to January 15, 1925, seems insufficient to account for a dissemination of infection to rats captured from three-fourths to 2 miles from where the vessels docked.

In addition, it seems contrary to all probability that the infection of shore rats should have followed inevitably, that the contaminated rats should have scattered to several widely separated points, and that the trapping force, which in November, 1924, numbered 12 men, should have caught the very rats in which contact had resulted in infection.

(5) To summarize, it appears from the known facts and from conjecture predicated thereon, that the rodent plague infection demonstrated in New Orleans from December, 1924, to January, 1925, represented a reimplantation which was effected at some date between June 30, 1923, and June, July, or August, 1924. It seems certain that the infection was introduced nearer the latter than the former date, as the intensive survey showed that the infection had gained no great headway.

## Field operations—Continued.

Number of buildings fumigated.....	0
Pounds of cyanide used.....	0
Pints of sulphuric acid used.....	0
Total cubic feet of space fumigated.....	0
New buildings inspected; passed.....	0
Premises inspected.....	0
Square yards of planking removed.....	0

## Laboratory operations:

## Rodents examined—

Mus norvegicus.....	34,702
Mus rattus.....	1,497
Mus alexandrinus.....	2,508
Mus musculus.....	0
Wood rats.....	0
Miscellaneous.....	0
Putrid.....	0
	<hr/> 38,707

Total rodents received at laboratory.....	38,707
Number of suspicious rats.....	233
Number of positive rats.....	0
Suspicious human cases examined.....	0
Positive human plague cases.....	0
Number of human plague cases to date.....	0
Number of rodent plague cases to date.....	0
Number of rodents captured to date.....	63,346
Number of rodents examined to date.....	38,707

## PLAGUE PREVENTIVE MEASURES, SEATTLE, WASH.

## Waterfront

Vessels inspected, for fending and rat guarding.....	618
Vessels fumigating.....	171
Sulphur used..... pounds.....	144,669
Cyanide used..... pounds.....	15,936
Muriatic acid used..... pints.....	76,839
Number of cubic feet fumigated.....	49,961,000
New rat guards installed.....	43
Defective rat guards repaired.....	150
Port sanitary statements issued.....	3,218

The usual patrol was maintained to enforce rat guarding and fending on all vessels arriving from plague-infected ports.

## Laboratory operations

Dead rats received.....	15
Rats trapped and killed.....	13,867
Rats after fumigation.....	1,145
Total rats.....	15,027
Rats examined for plague infection.....	10,477
Rats proved plague infected.....	0
Blocks poisoned.....	13
Poison disbursed..... pounds.....	342
Sanitary fills poisoned and re-poisoned.....	10

## Classification of rodents

Mus rattus.....	770
Mus alexandrinus.....	2,818
Mus musculus.....	2,109
Mus norvegicus.....	9,330
Average number of traps in use daily.....	580

All traps are inspected daily.



## TRACHOMA ERADICATION WORK

At the beginning of the fiscal year 1926 four trachoma hospitals were in operation at the following-named places: Knoxville, Tenn., Russellville, Ark., Rolla, Mo., and Eveleth, Minn. The hospital at Eveleth, Minn., was closed August 20, 1925, as the State legislature failed to appropriate necessary funds to cooperate in its continuance.

Trachoma in the white population does not appear to be especially prevalent in any one part of Minnesota, but cases are reported from many widely separated parts of the State. This increases the problem of treating any considerable number of cases, as the cost of travel is prohibitive to most of the patients, and the State had no funds to assist either in providing transportation or in the conduct of field work to locate the cases.

In June, 1926, the Kentucky State Board of Health made a generous allotment of funds to support its request that a trachoma hospital be established in that State. A building at Richmond, Ky., which had been bequeathed to the State Medical Society as a memorial to Dr. Ephraim McDowell by his granddaughter, Mrs. Elizabeth S. Irvine, was tendered to the service for use as a hospital. As the fiscal year ended preparations were being made to adapt the building for this purpose. The equipment of the Eveleth Hospital will be utilized in the Richmond Hospital.

*Knoxville, Tenn.*—The Knoxville trachoma hospital receives patients from an area comprising practically the eastern half of Tennessee, as well as a considerable number from Kentucky. Knoxville is an important center for many railroads and bus lines, making it accessible to all parts of east Tennessee.

The cooperation of the State health department and the Knoxville health and welfare association has made possible the construction of a four-room addition to the hospital, providing two wards capable of accommodating three or four beds each and two large rooms used as sitting rooms and wash rooms combined. Thus, there are separate sitting rooms for male and female patients, each equipped with large wash sinks so that patients may wash in running water. Individual lockers have been provided for towels and other toilet articles.

Through the field work carried on from the hospital it has been possible to follow up a large number of cases treated in the hospital and through these cases to locate new ones in the neighborhood. It has been gratifying to find that the results of treatment were in almost all cases very good; a number of cases were seen which had been treated several years ago and who were free from symptoms of trachoma. The home visits of the nurse afford an opportunity for instruction in hygiene and impressing the patient with the importance of treatment, and many cases come in for treatment as the result of these visits.

*Russellville, Ark.*—This hospital has cared for a large number of patients, although the building is poorly suited to hospital needs. Through the assistance of the county court and a number of public-spirited citizens, a two-room cottage has been purchased and moved to the hospital lot. Plumbing fixtures and lights were installed and the building is now used as a men's sitting room and bathroom. The washbasins formerly used have been supplanted by two wash sinks.

This cottage relieves the congestion in the house and improves living conditions, but does not increase the bed capacity of the hospital.

Trachoma is much more prevalent in Arkansas than was formerly believed, and most of the cases seen are of a very severe type. The clinics and field work have revealed areas of prevalence where but few of the sufferers knew of the existence of the hospital. The majority were resigned to their fate, feeling that there was no hope of relief. The instructive work carried on by the staff of the trachoma hospital has aroused many of these people to the fact that treatment is available and efficacious, and now the hospital is crowded and there is a long waiting list for admission. The hospital is now receiving patients from practically all sections of the State.

This hospital has also admitted a number of persons from Oklahoma who were suffering from trachoma in an aggravated form. It seems probable, from the number of these cases and the reports they bring of trachoma in their neighborhood, that the disease may be quite prevalent in the white population of that State, as it is already known to be among the Indians there.

*Rolla, Mo.*—The hospital at Rolla has been improved by the building of an addition, 12 by 14 feet, to the men's cottage in the yard, with shower, toilet, and wash sink. A wash sink for women patients has also been installed in their sitting room upstairs. These improvements increase the comfort of the patients and also make administration easier. The cost has been met from State local funds.

The Rolla hospital continues to have a waiting list of trachoma sufferers applying for admission. It is unfortunate that we are not able to secure buildings large enough to care for 40 or 50 patients, as that number could be handled without much increase in operating expense by the one doctor and two nurses now employed. This is true not only of the Rolla hospital, but of all others. At present every hospital is full and has a waiting list of patients, many of whom are in urgent need of immediate treatment, which can not be given them on account of lack of room. In locating new hospitals the aim should be to secure buildings capable of accommodating at least 40 patients.

*Laboratory.*—Associate Bacteriologist Ida A. Bengtson has continued her trachoma studies in the laboratory provided by the Missouri School of Mines at Rolla. Smears and cultures are made from each case admitted to the hospital and some very interesting work has also been done on sections of lid tissues. The opinion is often expressed by writers on trachoma that the acute symptoms are produced by secondary bacterial invaders, such as Koch-Weeks bacillus or pneumococcus. Results of routine examinations by Miss Bengtson of material from the eyes of trachoma patients indicate that it is very rare that the usual conjunctivitis-producing organisms predominate. They are sometimes present, but are seldom numerous.

The assignment of Asst. Surg. A. S. Rumreich to make an epidemiological study of trachoma marks an important step in the study of this disease. There is great need of this kind of study, and the information gained from it will undoubtedly be of great value. In anticipation of the epidemiological work the case-record forms used in the hospitals and at the field clinics have been revised and enlarged, so that there is on file a considerable amount of information regarding each patient which is available to the epidemiologist.

These records, which were put in use about one year ago, also aid him in his study of patients in their homes.

*Dispensary and hospital relief, operations, etc.*

	Eveleth, Minn. <sup>1</sup>	Knoxville, Tenn.	Rolla, Mo.	Russell- ville, Ark.	Total
<b>DISPENSARY RELIEF</b>					
Old cases, all causes	34	2,010	415	1,060	3,519
Old cases, trachoma	5	1,892	283	849	3,029
New cases, all causes	32	417	356	698	1,503
New cases, trachoma	6	113	164	154	437
Total attendance	66	2,527	771	1,760	5,124
Total number of treatments	66	2,589	907	1,807	5,369
Average daily attendance	1.3	6.92	2.11	4.82	312
Impaired vision from trachoma	6	55	125	126	146
Corneal opacity from trachoma	1	12	66	67	0
Blindness both eyes from trachoma	0	0	0	0	12
Blindness one eye from trachoma	0	2	6	4	63
Ulcer from trachoma	1	11	35	16	227
Pannus from trachoma	0	12	137	78	113
Entropion from trachoma	1	12	51	49	95
Trichiasis from trachoma	0	2	40	53	316
Photophobia from trachoma	5	97	123	91	462
Conjunctivitis	3	147	88	224	16
Glaucoma	0	1	8	7	48
Trachoma cases cured <sup>2</sup>	0	30	9	9	
<b>HOSPITAL RELIEF</b>					
Remaining from previous year	10	13	20	13	56
Admitted during the year	11	153	165	176	505
Discharged during the year	21	145	166	177	509
Remaining at close of year	0	21	19	12	52
Days relief furnished	437	4,834	6,464	4,425	16,160
Rations furnished	637	6,693	8,773	6,199	22,302
Cost of rations	\$311.69	\$3,339.91	\$4,374.54	\$3,119.35	\$11,145.49
<b>OPERATIONS</b>					
General anesthesia	0	0	15	6	21
Local anesthesia	11	131	126	140	408
Grattage	10	135	97	92	334
Entropion	1	5	33	51	90

<sup>1</sup> Closed Aug. 19, 1925.

<sup>2</sup> Hospital cases which have been reexamined and found cured. Impossible to determine with any degree of accuracy the total number cured, since it is difficult to see and examine many of them once they are discharged from hospital for home treatment.

*Educational work, house-to-house visits, etc.*

	Eveleth, Minn. <sup>1</sup>	Knoxville, Tenn.	Rolla, Mo.	Russell- ville, Ark.	Total
Public talks given	0	0	6	19	25
Persons (estimated) in audiences	0	0	60	1,580	1,640
Pamphlets on trachoma distributed	0	105	0	407	512
House-to-house visits	0	194	0	7	201
Persons in houses visited	0	899	0	38	937
Trachoma cases in houses visited	0	49	0	7	56
Schools visited	0	20	21	10	51
Pupils examined in schools	0	3,155	3,486	1,648	8,289
Trachoma cases in schools	0	48	1	10	59

*Field clinics*

	Missouri	Arkansas	Total
Number of clinics held	11	12	23
Number persons examined	1,999	900	2,899
Trachoma cases found	383	141	524
Suspicious cases found	25	20	45
Operations performed	113	16	129
General anesthetic	3	0	3
Local anesthetic	110	16	126
Physicians present	64	55	119

## SUPERVISION OF WATER SUPPLIES USED BY COMMON CARRIERS

The cooperative arrangement with State health departments for the supervision of water supplies used by common carriers for drinking and culinary purposes has been maintained during the year. In several instances, upon the request of the respective State health officers, service engineers have assisted in this and related work. One hundred and twelve supplies were examined by the district engineers in the States of Oklahoma, Arkansas, Texas, Louisiana, Tennessee, Kentucky, Idaho, Florida, and South Dakota. This number represents an increase of 36 over the last fiscal year.

Assistance along other lines was given in North Dakota, Utah, Oregon, Washington, Arizona, Nevada, Wyoming, and California. Particular attention is invited to an investigation of the significance of stock grazing on the watershed of the Walla Walla, Wash., municipal water supply, which lies within the Umatilla National Forest. Cooperation with the Forest Service in matters of this nature will be continued in the future.

## INTERSTATE RAILROAD WATER SUPPLIES

The American Railway Association, the American Short Line Railroad Association, and all of the railroads falling within the scope of the interstate quarantine regulations have cooperated during the year in a very satisfactory manner.

A significant line of work during the year by the district engineers was the examination of 21 coach yards throughout the country. Representatives of this division confer with the officers of the respective roads after investigations of this kind have been completed and submit recommendations for improvements in the coach yards. In most cases changes benefiting both the carriers and the traveling public are made.

In all districts inspections of water coolers on interstate carriers were carried out for the purpose of checking the reports on such equipment which had been submitted by these carriers. Although it was impossible to make a complete check on all cars, a satisfactory cross section of equipment was included and it is to be noted that only in a few instances were coolers found to be unsatisfactorily designed. During the past year final data were obtained from a large percentage of the carriers operating in the country. The time for completing the installation of satisfactory water coolers expired on January 1, 1925, but a few railroads were unable to complete their work before that time. However, all of these companies are progressing and will be requested to furnish information as to the date of completion. Significant reports were obtained from 405 railroads. These companies reported that such of their cars as fell within the scope of the interstate quarantine regulations carried 98,253 water coolers and that all but 2,975, or approximately 3 per cent, were constructed so that the ice and the water would be in separate containers. A review of these data also shows that 75 per cent of the 2,975 coolers not satisfactorily constructed are being used on cars confined to carrying members of crews.

In order that the State health departments might have a full year to complete the certification of sources reported by railroads on Janu-



ary 1 of each year, the tables which in previous annual reports covered the fiscal year will now be compiled so as to show the completion of certification during the preceding calendar year. The following table, therefore, shows the certifications for the calendar year 1925. It should be noted that this table is not comparable with those heretofore given. Since the greatest travel takes place from and to the larger cities in the country, and since all of the water supplies of such cities have been approved as being of satisfactory quality, the percentage of travelers safeguarded under this procedure is somewhat larger than the percentage of supplies certified might indicate.

*Railroad supplies*

[For calendar year of 1925]

State	Source classification				Certification status				Per cent sources acted upon
	Public <sup>1</sup>	Private <sup>2</sup>	Railroad	Total	Satisfactory	Prohibited	Provisional	Action pending	
Alabama.....	32	4	4	40	40	0	0	0	100
Arizona.....	14	1	9	24	5	0	0	19	21
Arkansas.....	44	8	21	73	2	1	0	70	4
California.....	64	5	37	106	66	0	0	40	62
Colorado.....	29	2	7	38	19	1	0	18	53
Connecticut.....	29	0	0	29	22	0	7	0	100
Delaware.....	6	0	0	6	6	0	0	0	100
District of Columbia.....	1	0	0	1	1	0	0	0	100
Florida.....	48	3	5	56	32	0	0	24	57
Georgia.....	61	1	0	62	11	0	0	51	18
Idaho.....	17	0	8	25	11	1	0	13	48
Illinois.....	68	6	30	104	67	1	36	0	100
Indiana.....	48	1	14	63	29	0	0	34	46
Iowa.....	66	1	10	86	50	3	0	33	62
Kansas.....	73	2	14	89	80	2	0	7	92
Kentucky.....	28	7	13	48	12	4	0	32	33
Louisiana.....	31	11	12	54	33	3	0	18	67
Maine.....	32	2	6	40	31	0	1	8	80
Maryland.....	15	1	6	22	13	2	5	2	91
Massachusetts.....	34	0	0	34	34	0	0	0	100
Michigan.....	62	7	25	94	69	2	0	23	76
Minnesota.....	46	2	24	72	42	4	0	26	64
Mississippi.....	33	7	10	50	36	0	0	14	72
Missouri.....	51	9	16	76	1	1	0	74	3
Montana.....	19	3	6	28	27	0	0	1	96
Nebraska.....	35	0	22	57	0	0	0	57	0
Nevada.....	9	0	12	21	19	0	0	2	90
New Hampshire.....	17	0	1	18	16	0	1	1	94
New Jersey.....	36	0	3	39	38	0	0	1	97
New Mexico.....	10	0	14	24	23	1	0	0	100
New York.....	103	4	22	129	82	3	10	34	74
North Carolina.....	56	7	9	72	42	0	18	12	83
North Dakota.....	16	2	10	28	0	0	0	28	0
Ohio.....	71	3	18	92	83	6	0	3	97
Oklahoma.....	44	2	6	52	7	0	9	36	31
Oregon.....	37	3	8	48	35	0	0	13	73
Pennsylvania.....	133	3	22	158	72	0	0	86	46
Rhode Island.....	2	0	1	3	3	0	0	0	100
South Carolina.....	38	1	1	40	0	0	0	40	0
South Dakota.....	23	0	8	31	12	1	0	18	42
Tennessee.....	25	9	12	46	2	0	0	44	4
Texas.....	107	10	50	167	32	0	53	82	51
Utah.....	17	0	7	24	17	0	0	7	71
Vermont.....	17	0	0	17	16	1	0	0	100
Virginia.....	44	3	7	54	49	2	3	0	100
Washington.....	35	2	21	58	2	0	0	56	3
West Virginia.....	32	9	11	52	49	2	1	0	100
Wisconsin.....	62	15	14	91	47	3	5	36	60
Wyoming.....	9	0	6	15	4	2	0	9	40
Total.....	1,929	156	571	2,656	1,389	46	149	1,072	60

<sup>1</sup> The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.

<sup>2</sup> A "Private" supply refers to a small well or spring supply used only by the carrier and the person owning it.

## INTERSTATE VESSEL WATER SUPPLIES

In a manner similar to that followed in the certification of water supplies used on railroads, the parallel work of investigating and certifying supplies used by vessel companies has been done in cooperation with State health departments. The following table prepared for the calendar year 1925 shows the status of this work:

*Vessel supplies*

[For calendar year of 1925]

State	Source classification				Certification status				Per cent sources acted upon
	Public <sup>1</sup>	Private <sup>2</sup>	Company	Total	Satisfactory	Prohibited	Provisional	Action pending	
Alabama.....	3	0	0	3	3	0	0	0	100
Arkansas.....	2	0	0	2	0	0	0	2	0
California.....	23	7	2	32	0	0	0	32	0
Connecticut.....	6	0	0	6	5	0	1	0	100
Delaware.....	1	0	0	1	1	0	0	0	100
District of Columbia.....	1	0	0	1	1	0	0	0	100
Florida.....	15	4	0	20	1	0	0	19	5
Georgia.....	3	0	0	3	3	0	0	0	100
Illinois.....	7	2	1	10	9	0	0	1	90
Indiana.....	4	0	0	4	2	0	0	2	50
Iowa.....	0	1	0	1	0	0	0	1	0
Kentucky.....	6	1	0	7	4	0	0	3	57
Louisiana.....	6	2	3	11	2	0	0	9	18
Maine.....	11	0	0	11	8	0	0	3	73
Maryland.....	2	1	1	4	2	0	1	1	75
Massachusetts.....	11	0	0	11	11	0	0	0	100
Michigan.....	12	0	0	12	12	0	0	0	100
Minnesota.....	1	0	0	1	1	0	0	0	100
Mississippi.....	6	1	0	7	4	0	0	3	57
Missouri.....	1	2	0	3	1	0	0	2	33
New Jersey.....	12	0	2	14	14	0	0	0	100
New York.....	14	0	0	14	7	0	0	7	50
North Carolina.....	5	2	0	7	3	0	2	2	71
Ohio.....	13	0	0	13	12	1	0	0	100
Oregon.....	12	1	0	13	0	0	0	13	0
Pennsylvania.....	8	2	0	10	4	0	0	6	40
Rhode Island.....	3	0	2	5	4	1	0	0	100
South Carolina.....	4	1	1	6	0	0	0	6	0
South Dakota.....	1	0	0	1	0	0	0	1	0
Tennessee.....	5	4	0	9	4	0	0	5	44
Texas.....	8	3	1	12	1	0	3	8	33
Vermont.....	1	0	0	1	1	0	0	0	100
Virginia.....	8	2	0	10	8	0	0	2	80
Washington.....	20	6	0	26	2	0	0	24	8
West Virginia.....	7	4	0	11	9	1	0	1	91
Wisconsin.....	1	0	0	1	0	0	0	1	0
Total.....	243	46	14	303	139	3	7	154	49

<sup>1</sup> The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.

<sup>2</sup> A "Private" supply refers to a small well or spring supply used only by the carrier and the person owning it.

## SUPERVISION OF WATER-SUPPLY SYSTEMS ON VESSELS

The work under the direction of the district engineers has continued as in the past. Due to the addition of temporary inspectors to several districts during the summer months a greater volume of work has been made possible.

Material assistance in detecting unsatisfactory water-supply systems on vessels has been rendered by State and city health departments and the service by the analyzing of samples of water taken

directly from the boats. Three thousand one hundred and six samples were analyzed and reported by cooperating laboratories during the year.

Last year 154 cases of typhoid fever were reported to district offices as originating on vessels engaged in interstate traffic. This year only 103 cases were reported. It is questionable whether this entire reduction should be credited to the improvement of water-supply systems on vessels and other advances in ship sanitation, but unquestionably some portion of it may justly be attributed to this work.

The district offices continued to receive and review plans of vessels intended for interstate operation before such vessels are launched. This procedure, which should be encouraged and developed, eliminates the necessity of changing fixtures on boats after they have been received by the owners and placed in operation.

The Steamboat Inspection Service has cooperated effectively during the year by submitting reports on vessels inspected.

The following table prepared for the calendar year 1925 is the first of its kind ever included in annual reports. It gives the status of vessel water-supply systems certified throughout the country:

*Vessel water supply systems*

[For calendar year of 1925]

District	Vessels on active status	Per cent of total vessels in district	Certification <sup>1</sup>			Per cent of district vessels certified	Per cent of total vessels certified
			Perma- nent	Tempo- rary	Total		
1-----	746	30.7	93	4	97	13.0	4.0
2-----	159	6.5	66	11	77	48.4	3.2
3-----	607	24.9	74	377	451	74.3	18.5
4-----	504	20.7	25	223	248	49.2	10.2
5 and 6 (combined)-----	417	17.1	78	1	79	18.9	3.2
Total-----	2,433	-----	336	616	952	-----	-----

<sup>1</sup> Only the latest certificate issued on a vessel was counted in case that vessel was both temporarily and permanently certified during the year.

INTERSTATE SANITARY DISTRICTS

DISTRICT NO. 1—MAINE, NEW HAMPSHIRE, VERMONT, MASSACHUSETTS, RHODE ISLAND, CONNECTICUT, NEW YORK, NEW JERSEY, AND PENNSYLVANIA

Associate Sanitary Engineer E. C. Sullivan has continued in charge of the activities of this district during the entire fiscal year.

As in previous years, the work was divided into several major classifications, differing from those of past years only in that more time was devoted to shellfish sanitation matters and that practically no rat-proofing or rodent-control work was dealt with. The major activities engaged in, and which are in general similar to those of the last few years, are as follows:

1. Supervision of drinking and culinary water supplies on vessels engaged in interstate traffic, including investigations of the general

sanitary conditions and detailed inspections of the drinking and culinary water-supply systems of such interstate carriers.

2. Supervision of drinking and culinary water supplies used by railroad companies in interstate traffic, including investigations of the general sanitary conditions of railroad coach yards and terminals and of the methods employed in the handling of the drinking and culinary water both in the coach yards and in the coaches.

3. Cooperation with the State health departments located within the district in the maintenance of a uniform procedure for the certification of sources of water used for drinking and culinary purposes on interstate carriers, both railroad and vessel, and cooperation in other sanitary engineering matters.

4. Cooperative activities in connection with the control of typhoid-fever cases involving vessels, such as reciprocal reporting with local health departments, United States marine hospitals and quarantine stations, and the subsequent investigation of such cases when deemed advisable.

5. Cooperation in shellfish sanitation activities under the direction of the shellfish sanitation office of the Public Health Service, including surveys of shellfish-producing areas and collaboration with State shellfish-control agencies.

6. Miscellaneous activities involving matters coming within the scope of the interstate quarantine regulations, such as investigation of anthrax cases and the furnishing of information regarding interstate quarantine matters when requested.

#### VESSEL WATER-SUPPLY SUPERVISION

During the year 210 inspections of vessels were made, 67 of which had not been previously inspected. In 121 instances the vessels inspected were passenger vessels, the remainder of the inspections being of freight vessels or of water boats engaged in the delivery of water to other vessels. In these inspections the general sanitary conditions of the vessels, as well as the arrangements of the drinking and culinary water-supply systems, were covered.

Improvements involving the rearrangement of the tanks, pumps, and distribution systems, so as to be independent of all other water-supply systems aboard the vessel in order to comply with the requirements of the interstate quarantine regulations, were necessary in many cases for the vessels not previously inspected.

For vessels already inspected, the yearly reinspections reveal, as a rule, the necessity for minor improvements, such as the providing of new filling hose, the more sanitary maintenance of water coolers, the elimination of common drinking cups and the replacement of "Unfit to drink" signs over impure water taps, which have been lost or painted over since the last previous inspection. Experience has shown that a careful review of the vessel water supply systems is necessary each year, particularly if the piping systems of the vessel have been overhauled or rearranged, since new connections which cross-connect the drinking and culinary water supply systems to other water supply systems of the vessel may have been introduced.



Based upon the inspections made during the year, favorable certificates of inspection were issued for 85 vessels, 50 of which were passenger carriers and 29 were freight carriers and water boats.

The cooperation with the naval architectural and shipbuilding companies of the district in the review of the plans for the drinking and culinary water supply systems of new vessels to be constructed or under construction within the confines of the district continued as in previous years. The plans for five new vessels were reviewed. Visits were made to the two shipyards engaged in the construction of these particular vessels for conferences and adjustments in the plans so as to comply more closely with the provisions of the Treasury Department circular No. 282, which is concerned with such matters. Among the vessels the designs of which were thus reviewed was the S. S. *Malolo*, intended for American-Hawaiian traffic and which is understood to be the largest passenger vessel constructed in a shipyard of the United States.

In accordance with the directions of the bureau, several hundred copies of reprint No. 1030 from the weekly, Public Health Reports, and concerned with the rat-proofing of vessels were mailed to naval architects, shipbuilding companies, and steamship operators located within the district. A number of requests for additional copies were received and supplied. At the suggestion of the assistant secretary of the American Society of Naval Architects and Marine Engineers, the members of the society were furnished with copies of the publication by the bureau.

As in previous years, the New York City health department has continued the supervision by a sanitary inspector of that department of the local excursion vessels and water boats operated in New York Harbor. The State health department of Massachusetts has cooperated in having samples of water collected from the water boats operated at the port of Boston and analyzed at the laboratory of the department. The health department of the city of Boston, Mass., has also cooperated in inspecting the sanitary conditions of the local excursion vessels which are not interstate carriers. The laboratory of the United States Marine Hospital No. 70 in New York City has likewise assisted in making bacteriological analyses of water samples obtained from trans-Atlantic vessels of the United States Lines, a subsidiary of the United States Shipping Board. Twenty-eight samples were thus analyzed.

There were 51 cases of typhoid fever involving vessels having headquarters in this district reported during the year by United States marine hospitals, United States quarantine stations, and local health departments. Of these cases, 25 were from vessels operated in interstate traffic and the remaining 26 cases came from vessels operated in foreign traffic. Table 2 indicates that the number of typhoid fever cases thus reported was less during this fiscal year than in previous years. The greatest number of cases from any one vessel was three, while four other vessels had two cases each.

TABLE 1.—*Summary of vessel water supply supervision*

Inspections:		Major conferences:	
First inspections—		With shipping officials-----	22
Passenger-----	36	With others-----	7
Freight-----	31		
		Total-----	29
Total-----	67		
Reinspections—		Water analyses made—	
Passenger-----	85	At United States Public	
Freight-----	58	Health Service laboratories-----	28
		At other laboratories-----	7
Total-----	143	Total-----	35
Certificates issued:			
Regular, favorable—			
Passenger-----	56		
Freight-----	29		
Regular, unfavorable-----	0		
Total-----	85		

TABLE 2.—*Summary of typhoid fever cases*

	Fiscal year			
	1923	1924	1925	1926
Cases reported by United States marine hospitals and quarantine stations-----	47	55	84	30
Cases reported by local health departments-----	30	28	27	21
Cases in which conditions on vessel were investigated-----	33	30	20	6
Cases involving passengers-----	14	16	14	6
Cases involving crew-----	59	67	97	45
Foreign-owned vessels involved-----	21	20	22	14
American-owned vessels involved-----	28	36	72	28
United States Shipping Board vessels involved-----	5	5	5	3
Other Government-owned vessels involved-----	3	6	5	0
Cases involving vessels operating in interstate traffic-----	18	17	28	25
Cases involving vessels operating in foreign traffic-----	35	49	57	26
Vessels having more than one case-----	6	5	15	5
Average number of cases per vessel-----	1.33	1.24	1.18	1.13

## RAILROAD WATER SUPPLY SUPERVISION

Detailed inspections were made during the year of the sanitary conditions of various railroad yards and of the methods employed in the handling of the drinking and culinary water supplied to the coaches. Among the railroad yards thus inspected were those of the Philadelphia & Reading Railroad and of the Pennsylvania Railroad at Philadelphia, Pa.; those of the Central Railroad of New Jersey, the Pennsylvania Railroad, and the Erie Railroad at Jersey City, N. J.; and those of the Boston & Albany Railroad and New York, New Haven & Hartford Railroad Co. at Boston, Mass. As the consequence of these inspections, improvements, and the correction of various existing conditions such as more adequate precautions in the handling of filling hose, rearrangement of yard hydrants, more efficient handling of the drinking water and coolers, and more systematic sanitation of the yards were taken up with the operating officials.

Observations of water coolers were made, wherever possible, to ascertain if the railroad company concerned was complying with the

requirements of interstate quarantine regulations now in effect for the complete separation of the drinking water and of the ice used for cooling purposes. In one instance the matter of the removal of obsolete coolers still present in the coaches but no longer used was taken up with the operating company concerned.

Conferences have been had at various times during the year with a number of the officials of State health departments located within the district relative to matters affecting the certification of sources of water supply used for drinking and culinary purposes by interstate carriers.

TABLE 3.—*Summary of railroad water-supply supervision*

Inspections:	
Sources of water supply-----	0
Coach yards-----	12
Major conferences:	
With railroad officials-----	10
With others (principally health authorities)-----	7

#### SHELLFISH SANITATION

In September and October, 1925, Associate Sanitary Engineer Frank R. Shaw and the district engineer made a survey of the coastal region of the State of Maine, involving about 1,200 miles of travel by automobile along the coast, in connection with shellfish sanitation activities. Based upon the survey, an extensive report covering the data obtained was prepared and transmitted to the Public Health Service office of shellfish sanitation. The data collected included information as to the general sanitary condition of the clam-producing areas of that State, the conditions under which the product was prepared for shipment, the amount of interstate shipments, and other pertinent facts. Charts showing the clam-producing areas were likewise prepared.

From February, 1926, to the close of the fiscal year the district engineer served as representative of the office of shellfish sanitation for matters affecting the State of New York. In that capacity a number of conferences were had with officials of the New York State Conservation Commission regarding the shellfish-control work in the State so that it might be carried out in uniformity with similar work of other shellfish-producing States. Inspections of shellfish-handling plants were made in some instances and approval of interstate shipments by dealers certified to by the State was made when warranted by the sanitary precautions taken in the handling of the product by the dealers concerned.

Assistance was also rendered at various times during the year in the shellfish sanitation work by the district engineer temporarily substituting for two of the sanitary engineers regularly attached to the shellfish work when detached from their stations for short periods of time.

#### MISCELLANEOUS ACTIVITIES

An investigation was made early in September, 1925, of a case of anthrax involving a resident of Massachusetts who died in California, having had the first symptoms of the disease while en route from his native State. Due to the length of time elapsing, it was not definitely

possible to trace the cause, but considerable significance was attached to the probable use by the decedent of a shaving brush purchased with an army kit bag in 1918, but which had not been used until taken with the kit on the western trip.

At the request of the field agent of the Public Health Service assigned to the Cape Cod health district a visit was made to that district late in November, 1925, to confer with local officials on sewage, garbage, and refuse-disposal problems.

Arrangements were made during the year for the furnishing by chlorination apparatus manufacturers of typical water-supply chlorination apparatus to be exhibited at the sesquicentennial in Philadelphia during a portion of the next fiscal year.

Among the meetings attended during the year while in the vicinity in connection with official work were those of the American Society of Civil Engineers, American Health Congress, American Water Works Association, and the Conference of State Sanitary Engineers. At these meetings an opportunity was afforded to conveniently take up various matters with public-health officials and workers who were present.

DISTRICT NO. 2.—DELAWARE, MARYLAND, VIRGINIA, WEST VIRGINIA, DISTRICT OF COLUMBIA, NORTH CAROLINA, SOUTH CAROLINA, GEORGIA, AND FLORIDA

During the entire year this district was in charge of Associate Sanitary Engineer A. P. Miller.

The activities of this district naturally fall into four major classifications: (1) Administrative duties relative to the sanitary engineering work of the domestic quarantine division; (2) inspection and supervision of water-supply systems, storage facilities, and all other water and sanitary appurtenances on interstate carriers within the jurisdiction of the district; (3) cooperation with State health departments in so far as certification of water supplies used by common carriers is concerned, and upon request in special investigations; (4) correlating and abstracting material for the Public Health Engineering Abstracts, together with a dissemination of other public-health literature among public-health workers.

#### VESSEL WATER-SUPPLY SUPERVISION

More attention has been given to the procurement and review of plans of vessels which are intended for interstate service in order to avoid the necessity of making changes in these vessels to obtain conformance with the interstate quarantine regulations after the vessels have been completed and launched. During the year this district has reviewed and approved, after slight changes, plans for five vessels.

Cooperation with city health departments in the collection and analyses of samples of water taken from interstate carriers has been continued, but the results obtained have not been as complete as could be desired. Samples collected and analyzed by the various cities are as follows: Baltimore, Md., 47; Wilmington, N. C., 27; Wilmington, Del., 10; Washington, D. C., 3.



Six cases of typhoid fever were reported in this district during the year as having occurred on vessels within its jurisdiction. Three of these which were reported as having occurred on the same United States Engineering Department dredge later were found not to be typhoid, but an investigation of conditions on this dredge was made and recommendations as to needed improvements were submitted.

At the close of the fiscal year there were found to be active 65 vessel companies owning a total of 168 vessels. This shows an average of a little less than 2.6 vessels per company. The employment of an inspector for a period of two months during the summer has been of great assistance, because it was possible for that inspector to give full time to the inspection of vessels. As can be seen in the following summary, 107 inspections were made, of which 47 were first inspections of vessels on which no inspection had theretofore been made. The percentage of first inspections is, therefore, 44, a figure which never before has been reached in this district. It is to be expected that this large number of first inspections would call forth the issuance of a larger number of noncompliance notices for slight infractions of the Interstate Quarantine Regulations. Twenty-one notices of this nature were delivered to vessel captains during the year.

*Summary of activities during fiscal year 1926*

Activity	Passenger	Freight	Both
Inspection:			
First inspection.....	5	7	35
Reinspection.....	5	2	53
Certificates issued:			
Temporary.....	2	2	0
Regular (favorable).....	5	6	55
Regular (unfavorable).....	0	0	0

RAILROAD WATER-SUPPLY SUPERVISION

The States in this district, excepting South Carolina, have all well-organized bureaus carrying on their respective sanitary engineering duties. South Carolina has a sanitary engineer, but the efficiency of the engineering bureau is questionable.

The district engineer visited every State in the district and assisted in making inspections of certain questionable water supplies.

MISCELLANEOUS

Transactions of the 1925 conference of State Sanitary Engineers were published during the year and, as in the past, the district engineer served as secretary-treasurer of this organization.

Public Health Engineering Abstracts were issued throughout the year, and it is to be noted that material was more readily available this year than last. The table following gives pertinent data relative to these abstracts.

*Public Health Engineering Abstracts*

	Fiscal year ended June 30—				
	1922	1923	1924	1925	1926
Publications available.....	243	260	169	132	92
Abstractors.....	28	42	72	81	79
Weekly issues.....	52	53	51	50	52
Articles abstracted.....	611	743	976	618	542
Person—issues.....	12, 142	17, 383	22, 672	23, 486	25, 532
Mailing list.....	283	405	497	490	491

In addition to the abstracts, 2,002 copies of 67 different publications and pamphlets were obtained and distributed among sanitary engineers of the States and of the Public Health Service.

DISTRICT NO. 3—OHIO, INDIANA, ILLINOIS, WISCONSIN, MICHIGAN, IOWA, MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA, AND NEBRASKA

Associate Sanitary Engineer Joel I. Connolly was in charge of this district up to February 26, 1926, when Associate Sanitary Engineer Isador W. Mendelsohn was placed in charge. The activities of this office have included: (1) Supervision of quality of drinking, cooking, and ablutionary water supplies and systems and general sanitary conditions on Great Lakes vessels and trains engaged in interstate traffic; (2) assistance to State health departments in establishing and improving local health service; (3) special activities.

## VESSEL WATER SUPPLY AND SANITATION SUPERVISION

Vessels under the supervision of this district are those of American and foreign registry plying on the Great Lakes and St. Lawrence River. There are 30 American companies, with 83 passenger ships, 93 American companies, with 491 freight ships, and 2 foreign companies, with 11 freight ships, now under this supervision. All of the principal passenger vessels were inspected during the year, and most of the freight vessels. Lack of personnel prevented inspection of all the vessels.

Most of the vessels use lake water treated aboard for drinking and culinary purposes. It is necessary, therefore, that a close supervision be maintained over the operation of water-treatment apparatus aboard and the purity of the water. This is accomplished by inspections by service engineers and laboratory analyses made through the cooperation of the State health departments of New York, Ohio, Illinois, Michigan, Wisconsin, and Minnesota, and by the city health department laboratories of Buffalo, Rochester, Sandusky, Toledo, Cleveland, Detroit, Chicago, and Milwaukee. The Provincial Department of Health laboratory of Sault Ste. Marie, Ontario, through the Canadian Federal health department has furnished valuable assistance by analyzing samples of water from the freight vessels passing through the locks. The Toledo health department has also made analyses of water from freight vessels. This cooperative laboratory work has led to discontinuance of raw lake water for drinking and culinary purposes on some im-

portant passenger vessels and many freighters and is impressing the vessel engineers with the need for careful and conscientious treatment of the water.

In the supervision of water supplies and systems and general sanitation aboard vessels the following points have been stressed: (1) Satisfactory treatment of lake water at all times where such water is used for drinking and culinary purposes, and also use of approved city water where polluted water, as in the Detroit River, is used for ablutionary purposes; (2) adequate sanitary storage tanks for pure water; (3) removal of all toilet outlets forward of seacock furnishing lake water for drinking and culinary purposes; (4) removal of raw lake-water taps at galley sinks; (5) removal of common towels and glasses; (6) prevention of use of untreated lake water in firehold for drinking; (7) sanitary condition of food storage places; (8) elimination of all cross connections between impure-water systems and the pure-water system; (9) painting or marking all pure-water lines light blue; (10) posting of water supply system certificates.

The cooperative arrangement with the Canadian Federal Department of Health has been maintained during the year and has resulted in interchange of information of vessel movements, water supplies, and sanitary conditions, laboratory analyses, typhoid-fever cases among Great Lakes seamen, and procedures regarding the supervision of vessels. Other agencies cooperating with this office were (1) the United States engineer's office at Sault Ste. Marie, Mich., which provided office space and facilities to the inspector of this district stationed at that place; (2) the inspectors of the Steamboat Inspection Service at Great Lakes ports, who furnished data of vessels; (3) the Lake Carriers' Association, which assisted in informing the freight companies regarding sanitary conditions aboard vessels and obtaining satisfactory improvements.

A number of Norwegian vessels coming with cargoes directly from Europe to Great Lakes ports and then operating between Canadian and American ports were inspected in accordance with the procedure stated in last year's annual report, page 101.

During the year there were 10 cases of typhoid fever among Great Lakes seamen reported by the marine hospitals. The occupations of these were as follows: 5 firemen, 2 deckhands, 1 wheelsman, 1 oiler, 1 watchman. The following table summarizes the typhoid-fever cases among Great Lakes seamen hospitalized at United States marine hospitals since 1915:

Navigation season	Cases	Navigation	Cases
1915.....	60	1921.....	13
1916.....	70	1922.....	17
1917.....	49	1923.....	25
1918.....	39	1924.....	21
1919.....	24	1925.....	7
1920.....	20	1926.....	10

Inspector H. M. Whimster was employed at Sault Ste. Marie, Mich., from July 1 to November 1, 1925, and May 1 to June 30, 1926. In these periods he inspected 297 freight vessels, reinspected 33, and collected the samples of water for analysis by the provincial health

department laboratory at Sault Ste. Marie, Ontario. He also prepared drawings of the pure-water systems aboard many of these vessels and made an investigation of a typhoid-fever case aboard the lighthouse tender *Aspen* at Cedarville, Mich.

Plans of four new vessels under construction at shipyards were reviewed in regard to satisfactory pure-water systems. Assistance has been rendered the Chicago health department in the proper installation and operation of sewage-retention tanks aboard vessels docking at Chicago to prevent pollution of bathing beaches and the lake near the water-intake cribs.

A special effort is being made in cooperation with vessel companies and employment agencies to have all food handlers aboard Great Lakes vessels examined physically and those found with communicable diseases dismissed. It is expected that this work will be completed by August 1, 1926.

It is the policy of this office not to prepare regular certificates for vessel water systems until sufficient data are available regarding the proper treatment of the water aboard. For this reason the number of such certificates issued in the past year is small. It is believed data will be available early in the coming year which will permit issuance of a large number of regular certificates.

*Summary of vessel water-supply supervision*

Inspections:		Certificates issued—Continued.	
First inspections—		Regular, favorable—	
Passenger .....	54	Passenger .....	7
Freight .....	306	Freight .....	73
Reinspections—		Regular, unfavorable .....	0
Passenger .....	9	Major conferences:	
Freight .....	35	With shipping officials .....	48
Docks .....	12	With others .....	52
Certificates issued:		Water analyses made at—	
Temporary—		City laboratories .....	928
Passenger .....	43	Canadian laboratories .....	795
Freight .....	350		

Conferences were held with manufacturers of water-treatment apparatus used aboard Great Lakes vessels regarding their design and operation, and arrangements were made for improved servicing of the machines.

COOPERATION WITH STATE HEALTH DEPARTMENTS AND RAILROAD WATER-SUPPLY SUPERVISION

Conferences were held with State health officers or sanitary engineers of States in this district in regard to improving the certification of railroad water supplies. A distinct improvement in many States is expected.

Assistance was rendered the State health departments of Iowa, Minnesota, Indiana, Wisconsin, and Illinois in regard to stream-pollution problems affecting them. On behalf of the State board of health, an inspection was made of the public water supply of Deadwood, S. Dak., used by railroads. Assistance was rendered the State board of health of North Dakota by making an investigation of the effect upon public health of a proposed dam across the Red River of the North at Grand Forks, N. Dak.



Assistance was rendered the joint committee on drinking-water supplies of the American Railway Association in endeavoring to have a report on coach yard sanitation adopted as railway standard practice. The district engineer attended the annual meeting of the American Railway Engineering Association to consider the report of the water-supply section.

Inspections were made of coach yards in Chicago in regard to sanitary conditions and facilities for watering and cleaning cars.

#### SPECIAL ACTIVITIES

The following special activities were carried out during the year in this district: (1) Investigation of the well-water supply of United States Veterans' Hospital, Edward Hines, jr., at Maywood, Ill., which was not completed on July 1; (2) data regarding the supplying and handling of milk on dining cars and vessels of several companies in this district were collected; (3) three papers were prepared, one for Public Health Reports, and two for The Nation's Health; (4) a brief account of the work of this office was prepared for a newspaper.

DISTRICT 4—ALABAMA, MISSISSIPPI, MISSOURI, LOUISIANA, OKLAHOMA, ARKANSAS, KANSAS, KENTUCKY, TENNESSEE, AND TEXAS

Associate Sanitary Engineer A. L. Dopmeyer continued in charge of this district during the fiscal year.

The activities of the district may be grouped under the following headings: (1) Supervision over water supplies used for drinking and culinary purposes on vessels; (2) Supervision over water supplies used for drinking and culinary purposes on railroad trains; (3) Cooperation with State health departments; (4) Special investigations, lectures, reports, etc.

#### VESSEL WATER-SUPPLY SUPERVISION

As last year, it was found impossible, on account of lack of time and personnel, to make the necessary inspections and to issue certificates for all vessels operating in the district. Particularly was this true of vessels operating out of ports on the Gulf of Mexico, so distantly removed from St. Louis as to admit of only infrequent visits. A recircularization of vessel companies during the year resulted in placing in the active files the names of 209 vessel companies, operating a total of 515 vessels. These figures are for carriers actively engaged in interstate traffic, and do not include vessels owned by the United States Government.

The policy of maintaining a constant record of the quality of water used on the more important passenger and excursion vessels, by obtaining bacteriological analyses from city and State authorities, was continued and was augmented somewhat. A total of 1,261 reports of the results of analyses of samples of water, collected and analyzed by the following agencies, were received during the year: (1) City health department, Cincinnati, Ohio; (2) city health department, Louisville, Ky.; (3) United States Public Health Service relief station, Paducah, Ky. (samples analyzed at State laboratory, Louis-

ville, Ky.); (4) city health department, St. Louis, Mo.; (5) city health department, Memphis, Tenn.; (6) State board of health, New Orleans, La. (samples analyzed in joint city and State laboratory); (7) city health department, Mobile, Ala. (samples analyzed in State branch laboratory at Mobile).

Samples of water were also collected by the district engineer during inspection trips from points in the States of Mississippi, Tennessee, and Arkansas, and were analyzed in the respective State boards of health laboratories.

The reports of bacteriological analyses received have been of great value in maintaining a control over the water supplies on many vessels carrying large numbers of passengers, a result which could have been obtained in probably no other way except by frequent personal inspections. In several cases, sickness in members of crews has been reported almost concurrently with reports of unsatisfactory analyses. In each case where bacteriological reports indicated an unsafe water supply on a vessel, instructions were immediately forwarded for sterilizing the water-supply system, and a personal inspection was made at the earliest opportunity.

During the year, reports were received from marine hospitals and relief stations of 28 cases of typhoid fever in seamen. The increased number over the last year may be attributed to the inclusion in this district of supervision over vessels operating on the Gulf of Mexico. An analysis of these reports shows that 11 are for persons who had been employed on vessels operating on the Gulf of Mexico, while 17 had been on river vessels. This shows a decided decrease in the rate for river vessels over the last year, and although there is no record on hand for cases reported from vessels operating on the Gulf of Mexico during the last year, the number reported this year seems to be very small in view of our limited opportunities to control conditions on these vessels.

Of the typhoid fever cases reported in connection with river vessels, but eight were for persons who had been employed on vessels owned by the United States Government, showing a proportionate decrease in the number of such cases over those of last year.

Upon receipt of a report of a case of typhoid fever, the vessel-operating company was immediately notified and instructions were issued for sterilizing the water-supply system and for making an inspection of the vessel. This action was followed by a personal inspection as time and opportunity permitted. In some cases it was found that living conditions of the patient ashore were insanitary, whereas conditions on the vessel were apparently satisfactory, and that the patient had been living ashore a large part of the time.

The inspection of water-supply systems on Government-owned vessels were made only upon request of the officials in charge. In case typhoid fever reports were received for persons employed on such vessels, however, the responsible official was notified and recommendations were made for averting further possible sickness. In one such case, where an investigation of the sickness of two persons indicated that it was probably the result of admittedly insanitary conditions on a vessel of the Mississippi River Commission, the matter was taken up with the president of the commission, and general rec-

ommendations for improvements were made for all district engineers serving under the commission.

Conferences were held at various times during the year with officials in charge of the operation of Government-owned vessels, including those of the War Department, Lighthouse Service, Mississippi River Commission, and the Goltra Barge Line. A decided increase in the interest of such officials in improving the water supply and sanitary conditions on the vessels under their charge has been noted, and there has been a noticeable improvement in the actual conditions on the vessels.

It has been the policy to recommend to officials of vessel companies the use of certified city-water supplies, wherever possible, in preference to using an apparatus on the vessel for rendering a polluted overboard supply safe and suitable for drinking and culinary purposes. It has been found particularly difficult to obtain an economical and efficient purification apparatus that will accomplish the desired end when used on steamboats operating in certain sections of the Mississippi and Ohio Rivers, where these rivers are heavily polluted and very turbid. There are a large number of vessels, such as towboats, however, on which it would be inconvenient and impracticable to obtain water from city supplies on account of the irregularity of their schedules. On such vessels recommendations were made to purify the water aboard in preference to attempting the carrying of an adequate supply of city water.

On account of the various makes of water-purification apparatus on the market, the designs of which render them unsuitable for use on steamboats, although otherwise probably satisfactory, it has been the policy in this district to keep the officials of vessel companies informed of certain requirements in this connection. As a result installations of unsatisfactory apparatus were found in only two cases during the year. In one of these cases the apparatus has since been abandoned and in the other it was found to have been purchased without due authority from the company, and has been rendered satisfactory by costly reconstruction.

The distilling plant continues to be the most satisfactory apparatus in general for purifying water aboard on steamboats. On 113 vessels of the 515 in the active list the water is purified aboard—in 111 cases by the process of distillation and in 2 cases by filtration followed with ozone treatment.

There are now six companies manufacturing commercial purification apparatus the products of which are being used with satisfaction on river vessels. In two of these cases the products of the companies are modified designs resulting from recommendations made by the district engineer and personal conferences with officials of the companies during the year.

Shipbuilding companies and companies planning the construction of new vessels have been informed concerning the proper design of the water-supply system.

The Steamboat Inspection Service has rendered a valuable service during the year by submitting certain data in connection with the water supply on vessels obtained at the time of its inspection.

*Summary of vessel water-supply supervision*

Inspections:		Major conferences:	
First inspections-----	16	With shipping officials-----	72
Reinspections-----	108	Other-----	6
Certificates issued:		Water analyses made:	
Temporary-----	71	State laboratories-----	65
Regular, favorable-----	23	City laboratories-----	1, 196
Regular, unfavorable-----	0		

## RAILROAD WATER-SUPPLY SUPERVISION

The supervision over water supplies used by railroads in interstate traffic consisted in making surveys of provisions in coach yards for watering cars, in investigating the water-supply equipment and its condition on trains, and in having unsatisfactory designs of water coolers corrected.

Surveys of coach yards were made, as opportunity permitted, at St. Louis, Mo.; Texarkana, Tex.-Ark.; Galveston, Tex.; New Orleans, La.; Montgomery, Ala.; Birmingham, Ala.; Nashville, Tenn.; and Louisville, Ky.

In cases where water-supply systems on trains were found to be unsatisfactory due to neglect or carelessness, the matter was called to the attention of the responsible local officials. The unsatisfactory design of a water cooler has, in one instance, been corrected by taking the matter up with officials of the manufacturing company.

## COOPERATION WITH STATES

On account of lack of sufficient funds and personnel in the health departments of some of the States in this district adequately to carry out the work of certifying water supplies used by interstate carriers, assistance was rendered where it was believed to be most necessary. Accordingly, surveys of interstate-carrier water supplies were made at the request of, and reports submitted to, the respective State boards of health, as follows:

State	Number of water supplies surveyed
Oklahoma-----	30
Arkansas-----	14
Texas-----	8
Louisiana-----	2
Tennessee-----	2
Kentucky-----	2

## MISCELLANEOUS

At the request of the State board of health of Texas, a paper was prepared for presentation at its school for filter plant operators, held at Fort Worth in January.

A paper was also prepared and delivered before a gathering of waterworks officials of Oklahoma at the Agricultural and Mechanical College in Stillwater in March.

Meetings of a scientific nature held at places in this district during the year were attended as opportunity permitted.



Abstracts of 21 articles were prepared for publication in the Public Health Engineering Abstracts.

DISTRICT 5.—ARIZONA, CALIFORNIA, COLORADO, NEW MEXICO, NEVADA, AND UTAH

DISTRICT 6.—IDAHO, MONTANA, OREGON, WASHINGTON, AND WYOMING

Sanitary Engineer H. B. Hommon continued in charge of interstate sanitary districts 5 and 6 and supervision over sanitation in national parks. He was also placed in charge of shellfish district No. 7 during the year. He was assisted by Associate Sanitary Engineer I. W. Mendelsohn, up to February 20, 1926, Associate Sanitary Engineer F. R. Shaw, after May 19, 1926, and Assistant Sanitary Engineer L. D. Mars, for the entire year. The work carried out during the year was divided as follows: (1) Examination of water-supply systems on vessels engaged in interstate traffic; (2) cooperation with the State departments of health in the two districts in the examination of water supplies used on trains operated in interstate traffic and in the investigation of special problems of sanitation; (3) cooperation with the National Park Service in improving sanitation in the national parks; (4) shellfish sanitation.

VESSEL WATER-SUPPLY SUPERVISION

The inspection of vessel water-supply systems was carried out by one engineer over a period of nine and one-half months. There are approximately 450 vessels divided among approximately 125 companies engaged in interstate traffic in the two districts. While most of the vessels can be inspected in Seattle, Portland, San Francisco, and Los Angeles and adjacent ports, there are large numbers on the rivers that do not come to the coast ports. The territory to be covered, therefore, embraces a coast line 1,400 miles long and rivers aggregating several hundred miles in length. An attempt has been made, however, to inspect all the passenger-carrying vessels, including ferries and all the large freight boats, and it is believed that more than 90 per cent of the passengers and seamen carried on vessels engaged in interstate traffic in districts 5 and 6 used water from vessels with approved water-supply systems.

TABLE 1.—*Summary of vessel water-supply supervision*

(Calendar year 1925)

Inspections:		Typhoid fever cases:	
First inspections—		Reported by marine hospitals	8
Passenger.....	45	(Three cases on 1 boat, all others on different vessels.)	
Freight.....	18	Investigations made.....	1
Reinspections—		Major conferences:	
Passenger.....	115	With shipping officials.....	11
Freight.....	32		
Certificates issued:			
Temporary—			
Passenger.....	0		
Freight.....	0		
Regular—			
Passenger.....	85		
Freight.....	24		
14656—26—9			

## RAILROAD WATER-SUPPLY SUPERVISION

A complete survey was made of all the water coolers in use on Pullman cars and coaches on all the railroads entering San Francisco, Oakland, and other San Francisco Bay cities, and a survey was made of the coolers on Pullmans and coaches of the Denver & Rio Grande Railway Co. at Denver. Practically all coolers were found to comply with the interstate quarantine regulations regarding the separation of ice and filling arrangements.

## COOPERATION WITH STATES

The work carried out in cooperation with the State health departments of the 11 States in the two districts followed the general lines of previous years. In Idaho a service engineer, working in conjunction with the State sanitary engineer, made a survey of 39 municipal and 13 railroad water supplies and investigated various problems of sanitation in the State. Conferences were held with the State health officer of Montana in regard to certification of water supplies in the State used on interstate carriers, and with the State health officer of Utah in regard to the cause of taste and odors in the Salt Lake City water supply. In Oregon, Washington, Arizona, Nevada, Wyoming, and California, problems of water supply, sewage, and garbage disposal have been considered with representatives of the respective State boards of health.

In cooperation with the State health officer of Oregon, an investigation was made of the pollution of the Willamette River at Portland, and conferences were held with the city authorities of Portland and the cities and towns on the Willamette River above Portland, in regard to methods for examining the river water to determine the extent of pollution. In connection with this work a deep-water sampling device for taking dissolved oxygen and bacteriological samples at 35 to 40 feet depths was designed by service engineers.

In compliance with a request from the United States Forest Service, an investigation was made of the sanitary significance of stock grazing on the watershed of the Walla Walla, Wash., municipal water supply, which is obtained from Mill Creek watershed, lying within the Umatilla National Forest. The report of the investigation is to be used by the Forest Service as a guide in deciding future controversies involving the dual use of watersheds of the national forests for grazing and sources of public water supplies.

A paper on the "United States Public Health Service and Municipal Water Supplies" was read before a conference of waterworks superintendents of Colorado, Wyoming, and New Mexico, and assistance was given to the State sanitary engineer of Montana and the director of the State hygienic laboratory of Nevada in the preparation of papers on the water supplies of Montana and Nevada.

## SANITATION AND MEDICAL ASSISTANCE IN THE NATIONAL PARKS

The assistance rendered the National Park Service, at the request of the Secretary of the Interior, in maintaining proper sanitary conditions in the national parks was continued during the year on a broader and larger scale than in previous years. Associate Sani-

tary Engineer Isador W. Mendelsohn was assigned to Yellowstone Park from June 1 to September 25, 1925, to look after water supplies, sewage and garbage disposal, mosquito control, and camp sanitation. Associate Sanitary Engineer Frank R. Shaw was detailed to the Grand Canyon National Park on May 19, 1926, to start the new activated sewage-treatment plant in operation and to continue in charge until a chemical and bacteriological laboratory is equipped and in operation and routine operation of plant is established.

Acting Asst. Surg. N. A. Strickland was on duty during the park season of 1925, and L. J. Stauffer during 1926. The work carried out by the acting assistant surgeons consisted of inspections of hotels, barber shops, mess houses, and other places handling and selling food products and soft drinks.

The more important activities carried out in the various parks during the year were as follows:

*Yellowstone.*—New construction work included the design and installation of sewerage systems and treatment plants for Camp Roosevelt, West Thumb, and the Transportation Co. headquarters at the Gardiner entrance, and a new water supply at West Thumb.

Particular attention was given to the operation of the 10 sewage-treatment plants constructed during the past few years. The effluents of six of the plants are sterilized with liquid chlorine to protect the streams from contamination. As a check on the efficiency of the sterilization, samples of effluents and streams were collected at intervals of about 10 days and sent to the laboratory of the Montana State Board of Health for analysis. The State board of health continued, as in the past, to make the analyses without cost to the Government except express charges. Daily readings of the amount of chlorine added to the effluent from each plant were made and qualitative and quantitative tests made and recorded for the amount of chlorine added. At four of the sewage-disposal plants the effluents are discharged onto natural beds of sand or gravel protected by concrete walls and top. A special design of housing over the natural filter beds has been worked out, so that the solids are retained in the inlet section and the supernatant fluid flows to succeeding sections. The data obtained from the analysis of samples of water from streams receiving sterilized sewage effluents and from streams adjacent to the natural filter beds show that the sewage from all the treatment processes is being handled in a manner that does not contaminate the streams.

A complete survey was made of all the water supplies used for domestic purposes, and where there was any suspicion regarding contamination samples were sent to the Montana State Board of Health for analysis. All supplies in the park were found to be of a high degree of purity.

The cold-water supply used for the bathing pool at the Upper Basin has not been satisfactory for two years. A new source was located and recommendations were made that it be developed and installed during the present year.

A decided improvement was made in the methods of disposing of garbage in the park during the year, but the solution of the garbage-disposal problem will not be reached until incinerators similar to those in use at Sequoia, Yosemite, and Grand Canyon are installed.

Mosquito-control work was carried out during the year along the same general lines as in previous years. Each spring infested pools are oiled, and in the fall all available funds are used for draining the areas where larvae were found in the spring. Practically 90 per cent of the areas within three-fourths of a mile of the principal junctions have been drained. The mosquito nuisance has been materially reduced, but it can never be entirely relieved, owing to the fact that there are large numbers of saddle and pack horses and bears traveling back and forth from forests to hotels and camps, and these animals bring mosquitoes with them in large numbers.

*Yosemite.*—The most notable achievement in the Yosemite Park during the year, from the standpoint of sanitation, was the completion of the garbage incinerator and the installation of a can-crushing machine to mash waste tin cans, and a garbage-can washing equipment to wash empty garbage cans. The waste tin cans are crushed into bales weighing about 200 pounds and are not burned in the incinerator. Their volume is reduced about 92 per cent. The hot water for washing the garbage cans is obtained from hot-water pipes in the incinerator used as bearing bars for the drying grates. There is no nuisance from odors or flies around the plant, and the cost of operation during the peak of the season is approximately \$12 per day less than the old method of disposing of the garbage by burning in windrows on the ground. By locating the incinerator near the headquarters, the cost of handling garbage has been practically reduced by one-half.

All the equipment used in connection with the disposal of garbage was designed by Public Health Service engineers, except the can-crushing machine which was recommended by service engineers. This equipment is probably more complete than any other ever used in handling a garbage-disposal problem.

Other activities in the park included cooperation with the civil engineer of the park in the operation of the sewage-disposal plant, location of and design of sewage-disposal plants for Tuolumne Meadows and Hetch Hetchy Dam developments, and general supervision over work connected with sampling and analyzing samples of water from Merced River below sewage-treatment plant.

*Grand Canyon.*—During the year a sewerage system, consisting of 5 miles of vitrified pipe and two long siphons for domestic sewage, and 1 mile of vitrified pipe for laundry wastes, were installed, and a sewage-treatment plant was constructed, which consists of pre-settling tank, activated sludge tank, Dorr clarifier, coagulation tank, rapid sand filters, and sterilization equipment. The treatment plant was placed in operation on May 29, 1926, and although there were some operating difficulties at first, the effluent was clear and stable and entirely satisfactory. The effluent is now being used for boiler purposes, irrigation, cooling water for Diesel engines, and later will be used for flushing toilets in restricted places. The distribution pipes for the reclaimed sewage will be inclosed in vitrified pipes, the outlets will be painted red, and posted, and the pressure on the reclaimed sewage pipes will be less than that in the fresh-water lines.

A garbage incinerator was designed for the Canyon, and on June 30, 1926, it was about one-half completed. It is of the same design



as the one built in Yosemite, except for a few changes that seemed advisable in order to secure longer life for the drying grates. The can-crushing machine and garbage-can washing equipment are similar to those in use at Yosemite. The garbage incinerator and other equipment, and the sewerage system and sewage-treatment plant were designed by Public Health Service engineers working in cooperation with Park Service and Santa Fe Railway engineers.

Other activities in the park included general inspections of camp grounds and all places handling or selling food products or soft drinks.

*Glacier.*—The work in Glacier included the regular routine inspections of hotels, camps, stores, etc., and recommendations for general improvements in methods of disposing of sewage and garbage and for a better water supply at one of the hotels.

*Mt. Rainier.*—General inspections were made and recommendations given for a new water supply for Longmire and better methods of sewage and garbage disposal for Paradise Valley automobile camp.

*Crater Lake.*—During the year a new sewerage system and disposal plant were constructed from plans prepared by Public Health Service engineers. Other work carried out in the park consisted of general routine inspections and recommendations for developing, storing, and pumping an adequate water supply for the park. Recommendations were also made for a modified chemical toilet for the boat landing at the lake.

*Sequoia and General Grant.*—General inspections of sanitary conditions were made during the year and a careful survey was made of the new water supply and sewerage systems and disposal plants in the two parks, and the garbage incinerator at Sequoia. These utilities were installed during the last few years from plans furnished by service engineers, and they were found operating in a very satisfactory manner. A suitable form of small trash burner was recommended for the automobile camps and it is becoming generally adapted in the national parks.

*Mesa Verde.*—Estimates were prepared for the cost of installing new water supply and sewerage systems and disposal plant. In addition a routine general inspection was made in the park.

*Zion National Park.*—As a result of recommendations made, storage and refrigeration facilities were greatly enlarged at the Lodge, and the equipment for sterilizing the sewage from the Lodge was replaced by more efficient apparatus and the filter galleries were increased by more than 100 per cent. At the Government automobile camp a new filter gallery further removed from the Virgin River was constructed.

*Platt.*—Up to this year no inspection had been made in this park by service engineers. Owing to the fact that the mineral springs, which constitute the main attraction of the park, are located practically at the water level of a stream that flows through the town of Sulphur, and the city sewer parallels the stream, there is a serious problem to work out in protecting the springs against contamination. There is also a sewage disposal problem to be worked out by the Government and the town of Sulphur. The State board of health of Oklahoma is cooperating and making regular analyses of samples of water from the springs.

*Carlsbad Cave National Monument.*—This cave was taken over by the Park Service during the year and a service engineer supervised the construction of emergency water supply and comfort stations in the cave and comfort station at cave entrance at surface of the ground, and made recommendations for permanent sewerage system and disposal plant at entrance.

*Pinnacles National Monument.*—A general inspection of the Pinnacles was made and recommendations were given for improving water supply and taking care of camp grounds.

*Conference of park superintendents.*—A service engineer attended the annual conference of park superintendents and presented a paper on the work that has been accomplished in the parks and the work that is yet to be carried out.

#### SANITARY CONTROL OF SHELLFISH

*California.*—The only oysters grown in California are shipped from the East or South and planted in San Francisco and Tomales Bays. These beds were inspected by a representative of the service and the California State Board of Health. The San Francisco Bay beds have been approved by the State board of health and the certificates for Tomales Bay are being withheld pending the removal of some potential contamination. The State board of health does not approve or disapprove shucking houses in the State.

*Oregon.*—This State produces only a very small amount of shellfish, and practically no work has been done in connection with examination of oyster beds.

*Washington.*—The oyster industry in Washington is by far the largest on the Pacific Coast. The native Olympia, or Pacific coast, oyster and the Japanese oyster are grown from "seed," and eastern oysters are imported and relaid on a large scale.

About two-thirds of the larger growing areas and shucking houses were inspected by a service engineer and found to be in good sanitary condition. The State board of health and the Olympia Oyster Growers' Association are cooperating in a practical and effective manner. The State board of health approves shellfish-growing areas and shucking houses.

#### SANITARY INSPECTIONS OF SHELLFISH AREAS

The active work in connection with the sanitary conditions of the shellfish industry was started at the beginning of the fiscal year, at which time the entire personnel, consisting of 2 medical officers, 4 sanitary engineers, 4 technical assistants in sanitary engineering, 1 bacteriologist, 1 pilot, 1 marine engineer, and 2 attendants, was assembled at the headquarters established at Craney Island, Va.

In order that the work might be carried on uniformly throughout the shellfish-producing regions, seven districts were formed, as follows:

- Shellfish district No. 1, New England States.
- Shellfish district No. 2, New York, New Jersey, and Pennsylvania.
- Shellfish district No. 3, Delaware and Maryland.
- Shellfish district No. 4, Virginia and North Carolina.
- Shellfish district No. 5, South Carolina, Georgia, Florida, and Alabama.
- Shellfish district No. 6, Mississippi, Louisiana, and Texas.
- Shellfish district No. 7, Pacific States.

Each of the first six districts was placed in charge of an engineer, who began actual field work on July 15. A survey of shellfish conditions on the Pacific coast was made by Sanitary Engineer R. E. Tarbett in November, and the supervision of the work in this district was then placed under the engineer in charge of interstate sanitary district No. 5.

A floating laboratory was installed on the launch *Shearwater*, in charge of a technical assistant in sanitary engineering, this laboratory cooperating with the district engineers and State authorities in examination of shellfish-growing areas.

A research laboratory was installed at Craney Island.

Two medical officers and one sanitary engineer devoted their time to administrative supervision of field and research activities.

It was recognized that the sanitary control of the shellfish industry within the borders of a State was strictly a State function, and that the service should not attempt to regulate the industry, except in its interstate commerce aspects, unless such work was undertaken in cooperation and conjunction with the State authorities.

It appeared that an important function of the Public Health Service was the promotion of reasonably uniform rules, regulations, and methods of enforcement in the various States, and work toward this end has progressed fairly satisfactorily.

The service has undertaken surveys of the methods of control exercised by each of the producing States to determine their adequacy to assure a reasonably safe product. It was recommended that each of the producing States issue a certificate that the shellfish produced in that State and shipped or offered for sale as food were produced and shipped in accordance with the sanitary requirements of a properly constituted State agency. If the surveys indicated that control measures were satisfactory, the State's certificate was accepted by the Public Health Service as sufficient evidence that the holder of such certificate had complied with the requirements prescribed for the shipment of shellfish in interstate commerce. Such acceptance of certificates of shippers in the various States was announced by the publication of lists of such accepted shippers, giving the name, address, and shipping number of each person or firm so certified.

Arrangements were made with the Canadian Minister of Health whereby a copy of each certificate issued by producing States was furnished him through the Surgeon General, and this was accepted as sufficient to cover the certification requirements of shellfish shipped to that country by the holder of such certificate.

The Public Health Service has furnished information to State and municipal health authorities as to the progress of shellfish sanitation in the various States, including a statement of opinion as to the adequacy of measures carried out and of the methods employed.

The floating laboratory installed on the launch *Shearwater* has visited 12 States on the Atlantic and Gulf coasts, actually doing work of examining shellfish in certain areas. This work has done much to promote uniformity of method of bacteriological testing of shellfish in the various States and has also given the State authorities ample demonstration of the advantages of a floating laboratory as compared with a fixed laboratory on shore.

The laboratory at Craney Island has assisted in the examination of routine samples whenever possible, and has carried on investiga-

tions on some of the fundamental problems of shellfish sanitation, such as (1) the relation of the index of pollution of shellfish to that of the water from which they are taken, (2) the comparison of different methods of laboratory examination, (3) comparative studies of the pollution of oysters and clams, (4) studies upon washing of oysters as a means of reducing bacterial contamination, (5) studies on the use of chlorinated water as a means of furthering shellfish sanitation, and (6) studies on the effect of temperature on shellfish pollution.

These studies were all in progress at the end of the fiscal year, and final conclusions have not been reached. A chlorination plant has been constructed for experimental purposes and will be operated for at least a full year in order that information may be obtained at all seasons and at different temperatures.

No outbreaks of typhoid fever attributable to shellfish have been reported during the year. Two small outbreaks alleged to have been due to infected oysters were investigated, but the evidence in both cases did not point to the consumption of oysters as a cause.

Throughout the year the advisory committee appointed by the Surgeon General in 1925 has been of great assistance in formulating the plan of work and in recommending administrative regulations governing the shellfish industry.

The work has been conducted in cooperation with the Bureau of Chemistry, Department of Agriculture, and the Bureau of Fisheries, Department of Commerce, as well as with the various State departments of health, or other State agencies having jurisdiction over shellfish sanitation in their respective States.

#### RURAL HEALTH WORK

Cooperative demonstration projects in rural sanitation were carried out in the fiscal year ended June 30, 1926, in 89 counties, or districts comparable to counties, in 20 States, as follows:

Alabama.....	9	Mississippi.....	3
Arkansas.....	2	Missouri.....	13
California.....	3	Montana.....	2
Georgia.....	8	New Mexico.....	8
Illinois.....	1	North Carolina.....	1
Iowa.....	1	Oklahoma.....	3
Kansas.....	4	South Carolina.....	1
Kentucky.....	1	Tennessee.....	6
Louisiana.....	2	Virginia.....	12
Massachusetts.....	1	West Virginia.....	8

The appropriation "For special studies of and demonstration work in rural sanitation," with which the cooperative rural health work of the service is conducted, was \$75,000 for the fiscal year 1926. Against this was set up a budget saving of \$2,000. The unexpended balance from the operations of the preceding fiscal year was \$10,055.55. Thus \$83,055.55 was available. The expenditures totaled about \$82,875. Of this amount, about \$4,800 was expended for special studies and administration, and \$78,075 was expended through specific allotments for the support of the 89 field projects. Over nine-tenths of the total funds for the operation of the field projects was provided by agencies—mainly, State, county, and municipal bodies—cooperating with the service in the demonstration work.



The plan of the work was similar to that of the several preceding fiscal years. This demonstration work in rural sanitation is made a part of a general program of well-rounded, whole-time county health service. By dovetailing the specific sanitary activities with other salient branches of county health work, overhead expense is lessened, lost motion and friction are prevented, and lasting results are obtained.

The results in the demonstration projects as a whole were highly satisfactory. Human lives were saved, human disease was prevented, human health was promoted, and economic resources amounting to many times over the cost of the service were conserved. The yield to the public welfare on the dollar invested for this work seems larger than that obtainable on the dollar which is or may be invested for any other public activity in normal times.

There is critical need for more whole-time, efficient, economical health service in our rural communities, as only about 15 per cent of our rural people are yet provided with such service.

The cooperation of the Public Health Service in this field of work evidently causes the development of efficient whole-time rural health departments which, without such cooperation, would not be developed.

There seems no other way in which the service can do as much at equivalent cost toward meeting its responsibility to prevent the spread of human infection in interstate traffic as it can through cooperation with State and local authorities to establish and permanently maintain efficient, whole-time local health service.

Counties with efficient, whole-time health departments, receiving financial assistance from the service, furnish exceptionally favorable situations for practical research studies of the diseases of man and conditions influencing the propagation and spread thereof—the sort of studies with which the service is especially concerned. (Sec. I, act of August 14, 1912, ch. 288, 37 Stat. L. 309.)

With efficient, cooperative county health service throughout the United States, large sums of money now expended by Federal and State agencies for quarantine and hospitalization could be saved, because much of the present need for these activities would no longer exist.

The evidence is that without sympathetic cooperation and financial assistance from State and Federal Government agencies, satisfactory progress in the development of efficient, whole-time rural health service in the United States within the next 25 years is not reasonably to be expected.

#### MOSQUITO CONTROL ALONG THE TEXAS-MEXICAN BORDER

During the fiscal year ended June 30, 1926, yellow-fever-control measures, instituted in 1923, were continued along the Texas-Mexican border.

In previous years work was maintained not only in the strictly border areas but also in those communities within close travel of the border, since this area, composed almost entirely of farming lands with numerous roads running through it in all directions, might, under favorable conditions, harbor yellow fever. On account

of limited personnel and funds with which to carry on the work, it was deemed best during the past year to concentrate upon strictly border areas, and operations in nonborder communities were discontinued October 1, 1925. Since that date the work has been intensified upon that part of the border extending from Laredo to Brownsville.

In most of the areas in which work has been undertaken local cooperation has been good, the various communities as a rule recognizing its importance, assisting in every way possible and enforcing regulations which would aid in mosquito control. Clean-up campaigns were inaugurated in many towns.

The methods employed have been practically the same as in previous years, stressing education of the public and cooperation with property owners for mosquito control. Weekly inspections were made in those communities where there was local cooperation. In other communities service employees made such routine inspections as were possible, the period between such inspections depending upon the activity of the local community.

During the year work was conducted in nine counties, although this number was reduced to four October 1, 1925, when work was discontinued in nonborder communities. There were 817,190 inspections of premises, 67,223 inspections of water barrels, 39,464 inspections of cisterns (including wells, tanks, etc.), and 1,910,240 inspections of other containers, making a total of 2,016,928 inspections made by service employees alone. In addition, a large number of inspections were made by local officials.

The number of water barrels was reduced over 50 per cent. In the city of Brownsville alone the number was cut from 1,400 to less than 400.

No dengue fever has been reported on the border during the year, nor have there been any cases of yellow fever.

In view of the fact that yellow fever no longer threatens from Mexico, the bureau, under date of March 10, 1926, directed the discontinuance of this work at the close of the fiscal year. The municipalities and communities along the border were advised in ample time of the action contemplated in order that they might arrange for local continuance of mosquito-control measures.

It is believed that the effect of the work done will be permanent, inasmuch as towns which heretofore paid no attention to water barrels and other containers where mosquito breeding was prevalent have reduced these to a minimum. Many cisterns have been filled or done away with entirely since the inauguration of the work.

On July 1, 1925, the personnel engaged upon this work consisted of three general sanitary inspectors, three furnishing their own auto transportation, and four part-time inspectors. On October 31, 1925, this force was reduced by the discontinuance of the services of one sanitary inspector furnishing his own auto transportation, and in May, 1926, a further reduction was made by the transfer to other service activities of one general inspector and one inspector furnishing his own auto transportation. The personnel remaining at the close of the fiscal year, consisting of two general inspectors, one inspector furnishing his own auto transportation, and four part-time inspectors, were separated from the service with the discontinuance of the work.

In the accompanying table the tabulated outline of the work for the year is shown:

*Yellow-fever prevention, Texas-Mexican border—Summary of work, fiscal year, 1926*

	Total area	Border counties	Nonborder counties
Counties worked in.....	9	5	4
Communities worked in.....	23	18	5
Number inspection trips made.....	394	379	15
Inspections of premises.....	817, 190	795, 931	21, 259
Inspections of barrels.....	67, 223	63, 091	4, 132
Inspections of cisterns.....	39, 464	36, 144	3, 320
Inspections of other containers.....	1, 910, 241	1, 874, 874	35, 367
Total.....	2, 016, 928	1, 974, 109	42, 819
Barrels found breeding.....	1, 925	1, 669	256
Cisterns found breeding.....	491	386	105
Other containers found breeding.....	3, 857	3, 749	108
Total.....	6, 273	5, 804	469
Barrels found producing.....	1, 084	971	113
Cisterns found producing.....	255	222	33
Other containers found producing.....	1, 985	1, 941	44
Total.....	3, 324	3, 134	190
Barrels protected.....	60, 019	57, 042	2, 977
Cisterns protected.....	35, 040	31, 877	3, 163
Other containers protected.....	4, 612	4, 612	-----
Total.....	99, 671	93, 531	6, 140
Percentage of containers found to each premise.....	2.46		
Percentage of containers breeding per premise, including culex.....	.076		
Percentage of containers producing per premises, including culex.....	.0406		
Percentage of containers breeding per container, including culex.....	.031		

# ACTIVITIES RECOMMENDED BY THE ADVISORY COMMITTEE ON THE EDUCATION OF SANITARIANS AND THE FUTURE OF PUBLIC HEALTH IN THE UNITED STATES

The following activities have been carried on in accordance with specific recommendations of the committee and with the committee's general policy:

*The recruiting of personnel.*—For the purpose of arousing the interest of students in public-health work, 12 lectures were delivered by C.-E. A. Winslow and one by his assistant, Ira B. Hiscock. Three of these were given at high schools and secondary schools, one at a medical school, and the others at schools of arts and sciences.

*The training of sanitarians for the future.*—An inquiry sent to State departments of health revealed that there had been employed by departments of health (mostly State departments) 77 medical school students during the summer of 1925 as a result of the promotion work of the International Health Board and the Public Health Service.

An inquiry sent to 15 schools awarding graduate degrees in public health showed that, in 1925, there were awarded (not including the D.P.H. offered by New York University) 76 graduate degrees, while in 1924 only 62 such degrees had been granted.

*The training of sanitarians now employed.*—The Public Health Service did not participate directly during the past year in encourag-

ing the attendance of health officers and other sanitarians at summer schools. There was a good enrollment in public-health courses at the 1926 summer schools, but a large proportion of the students were teachers.

A questionnaire was distributed among 4,000 health officers and other sanitarians to ascertain more definitely the needs and desires of sanitarians in respect to supplementary academic instruction. There were received 274 replies showing a definite interest in the problem and indicating that a considerable number might enroll for summer-school instruction where suitable courses of two or three weeks' duration available at near-by universities or colleges.

#### SUPERVISION OF INTERSTATE TRAVEL OF DISEASED PERSONS

The supervision of the travel of diseased persons on common carriers in interstate traffic and the transportation of things from disease-infected localities, together with general sanitation conditions of the carriers, has been continued as provided for under the interstate quarantine regulations.

#### CONFERENCE OF THE SURGEON GENERAL WITH STATE AND TERRITORIAL HEALTH OFFICERS

In accordance with provisions in the act of July 1, 1902, the annual conference of the Public Health Service with State and Territorial health officers was held in Washington, D. C., on May 24 and 25, 1926. It was attended by delegates from 35 States, 1 Territory, and the District of Columbia. A two-day program was carried out in which the following subjects were discussed:

1. Further observations on the status of morbidity reports and the establishment of a morbidity registration area.
2. The sanitary control of shellfish.
3. A summary of the points brought out at the April, 1926, meeting of the Advisory Committee on the Education of Sanitarians held at the Bureau of the Public Health Service.
4. Plague—studies in transmission and geographical limitations of infectibility.
5. The present status of smallpox in the United States and measures being taken for its control.
6. Vaccination of dogs against rabies.
7. Present status of scarlet-fever biologic products.
8. Progress in the research work of the Public Health Service during the past year.
9. The sanitation of automobile garages and service and filling stations. Proposed regulations for the manufacture and blending of tetraethyl lead. Distribution of ethyl gasoline.
10. The control of unsegregated lepers in the United States.
11. Some problems of county health work.



## DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION

In Charge of Asst. Surg. Gen. S. B. GRUBBS

### QUARANTINE TRANSACTIONS

During the fiscal year 1926 officers of the Public Health Service engaged in the administration of the United States quarantine laws inspected 17,056 vessels and 1,777,064 passengers and members of crews at the continental maritime stations. At insular stations 2,868 vessels and 378,414 passengers and members of crews were inspected. At foreign stations 6,774 vessels and 855,061 passengers and members of crews destined for ports of the United States were inspected. There were 5,019 vessels fumigated or disinfected at continental stations, 696 at insular stations, and 1,847 at foreign stations. At the border quarantine stations there were 67,209 travelers inspected, exclusive of the local interurban traffic.

### GENERAL PREVALENCE OF QUARANTINABLE DISEASES

*Cholera.*—The reported incidence of cholera increased considerably over that of the previous year. This disease continued with but little abatement in the endemic centers in southern India. Marked exacerbations occurred in China, Siam, and the Philippine Islands. A sharp outbreak in Japan, probably due to importation from China, was quickly suppressed.

The examination of potential carriers and the prohibition of the embarkation of those actually discovered at ports of embarkation in the Philippine Islands effectually prevented the introduction of this infection into the Hawaiian Islands and the United States.

*Plague.*—The unusual prevalence of plague mentioned in my last report continued throughout the year. Although there were considerable fluctuations in the number of cases reported from specific localities, the general distribution of this disease is remarkably similar to that during the previous year, thus illustrating the difficulty of eradicating plague once it has become established.

*Smallpox.*—This disease continued to occur throughout the world, including the United States of America.

Because of an epidemic in Florida a quarantine was imposed against that State by the quarantine board of the Bahama Islands and maintained for several weeks.

The undue and prolonged incidence of smallpox in Los Angeles, Calif., aroused the apprehension of the sanitary authorities of the Territory of Hawaii so that it was deemed advisable to require per-

sons embarking at ports on the Pacific coast of the United States to produce satisfactory evidence of immunity to smallpox before embarkation. This restriction was continued in effect from April 5, 1926, to June 17, 1926.

*Typhus fever.*—There was very little change in the reported prevalence of typhus fever. Although this disease is widely distributed, it is not epidemic except in Soviet Russia. It is probable that the incidence in Russia is decreasing.

Typhus reappeared in the Canary Islands, Italy, and Tripoli. It apparently increased in Czechoslovakia and Ireland and diminished in Lithuania and Poland.

*Yellow fever.*—The number of cases of this disease reported was approximately the same as was reported during the previous year. However, their distribution was more extensive since cases were reported from the Gold Coast, the Ivory Coast, Liberia, Nigeria and Senegal (Africa), and Brazil, in South America. The sharp outbreak at Parahyba, Brazil, has caused some apprehension, but, due to the energy and promptness of the measures for its eradication, will probably soon be brought under control.

#### CHANGES IN QUARANTINE PROCEDURE

One amendment to the quarantine regulations authorizing the Surgeon General to prescribe rules under which the six-month period between fumigations may be extended for, first, vessels plying regularly between ports not infected with plague; second, vessels whose construction does not favor the harborage of rats, was promulgated. In accordance with the terms of this amendment quarantine officers have been authorized to extend the period between fumigations for an additional six months in the case of certain classes of vessels if, upon careful inspection, no evidence of rat infestation or harborage is found. It is expected that this procedure will materially diminish the number of tankers fumigated.

The official declaration that the cities of New Orleans, La., and Oakland, Calif., are free from plague, with consequent lifting of the special restrictions imposed during the last fiscal year, has materially lightened the work at the respective quarantine stations.

The question of the disinfection of the rags imported into the United States for the manufacture of paper has for many years occupied the attention of this division. On December 3, 1925, the medical officers in charge of quarantine stations were advised that consular certificates of disinfection or origin will no longer be required as a prerequisite to admission of shipments of rags into the United States, its possessions or dependencies, and that when rags are obviously filthy or infected their admission into the United States should be refused.

#### NEW QUARANTINE STATION AT MOBILE, ALA.

In accordance with the terms of an act of Congress approved February 15, 1925 (Public, No. 425, 68th Cong.), authorizing the

Secretary of the Treasury to remove the quarantine station situated at Fort Morgan, Ala., to Mobile, at a cost not to exceed \$300,000, the Governor of Alabama on May 14, 1925, executed a deed transferring approximately 80 acres of Sand Island, located in Mobile Harbor, to the United States as a site for the new quarantine station. By the second deficiency act approved March 4, 1925 (Public, No. 631, 68th Cong.), \$200,000 was made available for beginning the construction. The \$100,000 necessary for the completion of the work was appropriated by the next Congress (Public, No. 35, 69th Cong.) and approved by the President March 2, 1926.

Construction of the new station was commenced in the spring of 1926 and, if the contracts are fulfilled, it will be completed February 24, 1927.

The plans for the station, as approved, provide for the following: A dredged basin—a widening of the main ship channel—to serve as an anchorage and mooring place for vessels and to be provided with five clusters of mooring dolphins; a wharf of timber construction; buildings designated and described as follows:

No. 1. Office, storehouse, and carpenter shop; one story, hollow-tile construction.

No. 2. Disinfecting plant, laundry, and machine shop; one story, hollow-tile construction.

No. 3. Detention barracks, attendants' quarters, kitchen, and mess; two stories, hollow-tile construction, accommodating 120 steerage passengers, on double-tier bunks, and 32 cabin passengers in 16 rooms.

No. 4. Detention hospital and nurses' quarters; two stories, hollow-tile construction, with accommodations for 24 patients (in 5 wards with 4 beds each and 2 rooms with 2 beds).

No. 5. Double set of attendants' quarters; two stories, brick construction.

No. 6. Quarters for medical officer; two stories, brick construction.

No. 7. Quarters for medical officer; two stories, brick construction.

No. 8. Garage and quarters for attendants; two stories, hollow-tile construction.

No. 9. Fumigating building; one story, concrete construction.

Those of the buildings requiring heating will be equipped with individual heating plants. Water for domestic uses and fire protection, electric current, and telephone service is provided by extension from the city of Mobile, across Choctaw Channel.

#### ACQUISITION OF THE TEXAS QUARANTINE SYSTEM

By an act of Congress approved June 5, 1920 (41 Stat. 875), \$90,071 was appropriated for the transfer and purchase of the Texas quarantine stations. Considerable difficulty has been experienced in consummating the purchase of these stations because of the inability of the State of Texas to prove title to all of the properties. The State authorities were able to furnish title for the stations at Sabine and Aransas, but not for those at Point Isabel and Laredo. The site of the station at Galveston had been patented to the Government of the United States on June 28, 1912.

On August 14, 1924, the Comptroller General of the United States decided that the appropriation act of June 5, 1920, did not permit the purchase of individual stations of the quarantine system but only of the system as a whole, so that it was necessary for the Congress to pass a new act (approved April 26, 1926) authorizing the purchase of those stations to which the State of Texas can give satisfactory title.

Investigation of the titles to those stations with a view to the completion of the transfer is now in progress.

#### INTERNATIONAL RELATIONS

Two meetings of the Permanent Committee of the International Office of Public Hygiene were held during the year—one in October and one in May. The United States was represented by Surg. W. W. King. Subjects covering a considerable portion of the field of public health were discussed.

An international conference, called by the French Government to consider a revision of the sanitary convention at Paris in 1912, was held in Paris from May 10 to June 21, 1926, and was attended by delegates from 67 countries and dominions. The United States was represented by Surg. Gen. H. S. Cumming, Senior Surg. Taliaferro Clark, and Surg. W. W. King.

Since the changes in the treaty were, on the whole, satisfactory, the American delegates signed, but with the following reservations:

The plenipotentiaries of the United States of America declare formally that the signature by them of the international sanitary convention of this date should not be interpreted in the sense that the United States admits that the signatures of the representatives of a Government which they have not recognized or an adhesion of such a Government is equivalent to the signature or to the regular adhesion of the power in the name of which the Government signs or adheres. They declare in addition that the participation of the United States of America in the international sanitary convention of this date carries no contractual obligation of the United States toward a signatory or adhering power represented by a Government or body which the United States does not recognize as corresponding to the Government of that power.

The plenipotentiaries of the United States of America declare also that their Government reserves the right to decide if, from the point of view of the measure to be applied, a foreign area should be considered infected and to determine the measures which should be applied under special circumstances to arrivals in its own ports.

#### VIOLATION OF QUARANTINE LAWS

During the fiscal year the department assessed fines aggregating \$1,395 for violations of the act of February 15, 1893, because of the failure of masters of vessels to present American consular bills of health.



## TRANSACTIONS AT CONTINENTAL QUARANTINE STATIONS

*Transactions at continental quarantine stations for the fiscal year ended June 30, 1926*

Stations	Vessels in-spected	Vessels fumigated	Passengers and crews in-spected	Stations	Vessels in-spected	Vessels fumigated	Passengers and crews in-spected
Aberdeen, Wash. <sup>1</sup>	75	72	3,161	Miami, Fla. <sup>4</sup>	547	0	18,425
Atchafalaya (Morgan City), La.	0	0	0	Mobile, Ala.	355	111	10,880
Baltimore, Md.	702	332	24,241	Monterey, Calif.	0	0	0
Beaufort, S. C.	0	0	0	New Bedford, Mass.	17	0	536
Boca Grande, Fla.	29	7	590	New Orleans, La.	2,102	529	95,695
Boston, Mass.	968	212	100,638	Newport, Oreg.	0	0	0
Brownsville, Tex. <sup>2</sup>	0	0	1,371	Newport, R. I.	1	0	38
Brunswick, Ga.	21	4	592	New York, N. Y.	4,470	1,179	1,072,903
Cape Fear (Southport), N. C.	64	22	2,045	Ogdensburg, N. Y.	9	0	73
Cedar Keys, Fla.	0	0	0	Pascagoula, Miss.	20	6	115
Charleston, S. C.	164	31	5,197	Pensacola, Fla.	117	67	3,845
Columbia River (Astoria), Oreg.	147	124	5,081	Perth Amboy, N. J.	37	21	1,035
Coos Bay, Oreg.	18	17	645	Port Ageles, Wash.	8	0	205
Cumberland Sound (Fernandina), Fla.	8	2	278	Port San Luis, Calif.	9	0	353
Delaware Breakwater, Del.	6	0	114	Portland, Me.	156	45	6,111
Del Rio, Tex. <sup>2</sup>	0	0	2,270	Port Townsend, Wash.	377	49	33,010
Eagle Pass, Tex. <sup>2</sup>	0	0	3,076	Presidio, Tex. <sup>2</sup>	0	0	75
Eastport, Me.	0	0	0	Providence, R. I.	100	2	10,088
El Paso, Tex. <sup>2</sup>	0	0	27,318	Rio Grande and Roma, Tex. <sup>2</sup>	0	0	2,887
Eureka, Calif.	7	2	298	Sabine, Tex.	410	161	13,938
Fall River, Mass.	41	0	697	St. Andrews, Fla.	18	12	317
Fort Bragg, Calif.	0	0	0	St. George Sound, Fla.	0	0	0
Fort Monroe, Va.	731	272	28,105	St. Joseph, Fla.	3	0	0
Freeport, Tex.	106	0	1,567	San Diego (Point Loma), Calif.	783	14	17,175
Galveston, Tex.	593	148	22,417	San Francisco, Calif.	510	514	79,276
Georgetown, S. C.	2	0	17	San Pedro, Calif.	1,250	240	52,518
Gloucester, Mass.	0	0	0	Santa Barbara, Calif.	0	0	0
Gulfport, Miss.	58	31	1,534	Savannah, Ga.	163	26	4,958
Hidalgo, Tex. <sup>2</sup>	0	0	2,023	Seattle, Wash.	0	171	0
Jacksonville, Fla. <sup>3</sup>	163	27	4,478	South Bend, Wash.	9	9	378
Ketchikan, Alaska	12	0	246	Tampa Bay, Fla.	336	70	8,724
Key West, Fla.	275	20	40,983	Vineyard Haven, Mass.	3	0	23
Laredo, Tex. <sup>2</sup>	0	0	28,189	Washington, N. C.	0	0	0
Marcus Hook (Philadelphia), Pa.	1,056	470	36,312	West Palm Beach, Fla. <sup>5</sup>	0	0	0
				Total	17,056	5,019	1,777,064

<sup>1</sup> Formerly Hoquiam, Wash.

<sup>2</sup> Border stations. Figures do not include local travelers who, however, were subjected to cursory inspection. Through travelers were given close examination.

<sup>3</sup> Formerly St. Johns River.

<sup>4</sup> Formerly Biscayne Bay.

<sup>5</sup> Opened Apr. 1, 1926.

# SUMMARY OF TRANSACTIONS AT NATIONAL (CONTINENTAL AND INSULAR) QUARANTINE STATIONS FOR THE FISCAL YEAR ENDED JUNE 30, 1926

Total inspection:<sup>1</sup> Vessels, 19,924; crew, 1,221,077; passengers, 934,401. Total persons inspected, 2,155,478. Vessels passed on certificate of ship's medical officer, 343.

<sup>1</sup> An inclusive figure, regardless of treatment or report elsewhere.

*Persons and vessels detained or treated—those inspected only not included*

	Nature of infection							Total
	Yellow fever	Rodent plague	Human plague	Small-pox	Typhus	Cholera	Leprosy	
Infected vessels <sup>1</sup> .....				24		<sup>2</sup> 3	6	33
Number of cases <sup>3</sup> .....				30		<sup>4</sup> 13	7	50
Number of crew detained.....	104		<sup>5</sup> 206	595		230	4	1,139
Number of passengers detained.....	14		<sup>6</sup> 1,014	178	4	128	3	1,341
Persons bathed and disinfected.....				299	86	238	2	625
Persons vaccinated.....				15,244		1,024		16,268
Laboratory examinations (persons) <sup>7</sup> .....	157		2	4	44	9,779	10	9,996
Vessels fumigated: <sup>8</sup>								
HCN.....		1,000						1,000
SO <sub>2</sub> .....		1,967		3		4		1,974
CNCl.....	2	1,486					3	1,491
HCN and SO <sub>2</sub> .....		11						11
HCN and CNCl.....	1	1,181		1				1,183
CNCl and SO <sub>2</sub> .....		27						27
Zyklon "B".....		22						22
CHOH.....				3				3
CHOH and KMnO <sub>4</sub> .....				4				4
Total vessels fumigated.....								5,715

<sup>1</sup> Vessels with cases on board on arrival or reported en route.

<sup>2</sup> Two cholera-infected vessels were remanded to Cebu for treatment after removal of the sick.

<sup>3</sup> Includes carriers.

<sup>4</sup> Twelve cholera carriers were discovered on vessels arriving at Manila.

<sup>5, 6</sup> Two hundred and four seamen and 1,014 passengers from Amoy were detained at Manila because of an epidemic of human plague at Amoy.

<sup>7</sup> Includes microscopical examinations of blood, excreta, tissue, etc.

<sup>8</sup> Includes vessels fumigated after passing quarantine in accordance with provisional pratique. Periodic fumigations for destruction of rodents are listed in the "Rodent plague" column. Vessels fumigated are entered in the columns indicating the disease for which fumigated, as well as opposite the fumigating agent used.

Number of rats destroyed on ships, 30,979; rats examined, 21,731.

#### REPORTS FROM CONTINENTAL QUARANTINE STATIONS

*Boca Grande, Fla.*—Acting Asst. Surg. H. P. Bevis in charge. Post office and telegraphic address Boca Grande, Fla.

On June 30, 1926, the buildings on La Costa Island, which had been occupied under authority of a revocable license from the War Department dated January 25, 1905, were abandoned. The Government property was transferred to Boca Grande and to Mullet Key. The new headquarters for the station is at Boca Grande, Fla.

The condition of this station, due to deterioration, was such that further exposure to the severe storms normally encountered in this vicinity would endanger the lives of the attendants and the property of the Government. It would have cost a minimum of \$16,000 to put the buildings in repair.

*Boston, Mass.*—Surg. Frieuch Simpson in charge. Post office and telegraphic address Gallops Island, Boston, Mass.

In 148 (or approximately 70 per cent) of the 212 vessels fumigated no rats were found upon search following fumigation. The remaining 64 vessels (approximately 30 per cent) yielded 642 rats, of which 362 were identified as *Rattus alexandrinus*, 262 *Rattus rattus*, and 4 *Rattus norvegicus*. Three hundred and fifty rats were found in the holds, and 292, or 45 per cent, were found in the superstructures, repeating previous experience that a considerable proportion of a ship's rats are found outside of the holds.

No vessel arrived with suspected quarantinable disease aboard. Pending confirmation of the diagnosis of a case suspected to be chicken pox, the crew of one vessel, numbering 24 persons, were vaccinated against smallpox. Twenty of those vaccinated showed an acceptable immunity reaction within 36 hours.

The inspection of third-class passengers for vermin was continued. Three thousand one hundred and sixty-five persons, approximately 25 per cent, of arriving alien passengers were examined intensively for vermin. Only 15 individuals, all female, were found to be vermin infested. The low rate of infestation found on arrival, as compared with former years, attests the thoroughness of the preliminary inspection conducted by medical officers of the Public Health Service abroad and the cooperation of ships' officers in disinfecting passengers en route.

The inoculation of guinea pigs with an emulsion of pooled splenic tissue of rats recovered from fumigated vessels was continued. No plague infection was found. The rats were classified as follows:

Species	Male	Female	Total examined	Noted pregnant	Foeti noted
<i>R. norvegicus</i> .....	15	15	30	1	9
<i>R. alexandrinus</i> .....	107	128	235	29	176
<i>R. rattus</i> .....	193	166	359	35	228
Total.....	315	309	624	64	413

Of the 968 vessels inspected 325 had called at ports considered to be infected with one or more of the quarantinable diseases. It appears, therefore, that approximately one vessel out of three visited ports infected with quarantinable disease, the possible exposure to these diseases being most common in the cases of plague and smallpox, frequent in typhus and cholera, occasional in yellow fever, and rare in leprosy and anthrax.

*Cumberland Sound, Fla.*—Acting Asst. Surg. D. G. Humphreys in charge. Post-office and telegraphic address, Fernandina, Fla.

Arrangements have been completed for the return to the War Department of the reservation on Amelia Island, which has been used as a quarantine station under authority of a revocable license dated January 27, 1905.

*Key West, Fla.*—Acting Asst. Surg. J. Y. Porter, jr., in charge.

When the American steamship *Benjamin Brewster* arrived from Rotterdam, Holland, one seaman was found to be convalescing from smallpox. The sick man was removed to Marine Hospital No. 10. The other members of the crew were vaccinated and the vessel remanded to Galveston, the port of destination.

Because of the dilapidated condition of the hulk *Wisteria*, formerly used for the housing of detained passengers, it was abandoned late in April and sold after the serviceable property on board had been transferred to Marine Hospital No. 10. The persons to be detained for observation or treatment will be kept on board the vessel on which they arrive or at Marine Hospital No. 10.

*Marcus Hook, Pa.*—Surg. F. A. Carmelia in charge.

The principal cargoes entering this port direct are fruit, sugar, logwood, and crude oil from Carribean and Gulf ports; bulk min-

eral oil from western South American, northern African, Spanish, and Norwegian ports; china clay and general cargoes from North Atlantic, European, and southeastern African ports (chiefly British and Spanish), with a few "round-the-world" transits; cork from Spanish Mediterranean ports; and wood pulp and lumber from Canadian ports. The passenger traffic is largely incidental to cargo vessels having limited passenger accommodations and carrying up to 25 passengers. Only one large, strictly passenger liner entered the port during the year, the German steamship *Derflinger* from Bremerhaven.

The practice of combining the quarantine inspection and the medical inspection of aliens was continued, conserving both the time of the vessel and official effort.

It was not found necessary to detain anyone for quarantinable disease during the year. The sanitary status of both vessels and personnel continues to improve from year to year.

Since relatively few regular line vessels call direct at this port, the percentage requiring fumigation continues relatively high. Of 1,056 vessels inspected, 313 (29 per cent) were granted provisional pratique and fumigation ordered following discharge of cargo. Sixty-two per cent of these vessels were from ports considered to be plague infected; 36 per cent were ordered to be fumigated because of the expiration of the six months' period between fumigations; and 2 per cent were ordered to be fumigated because of the expiration of the three months' period between fumigations. Seventy-two per cent of the vessels entering under provisional pratique and requiring fumigation completely discharged their cargo and were fumigated, while 28 per cent were remanded to some other port for fumigation. This represents an increase of 12 per cent in the number of vessels remanded to other ports over the number remanded during the last fiscal year. The growing tendency of vessels from foreign ports to call at several ports in the United States complicates the enforcement of provisional pratique and necessitates remanding to one, two, or even three other ports before fumigation after discharge of cargo is possible. This situation is of particular significance if fumigation is mandatory. The increased number of vessels which load and discharge cargo simultaneously at several of the United States ports of call complicates the enforcement of provisional pratique and the exercise of remanding.

The number of vessels remanded to Philadelphia from other ports for fumigation is increasing each year, because this port is the final port of call for several lines running around the world and from the Far East. Forty-seven per cent of the total number of fumigations were done on vessels in these trades. Two hundred and twenty-two of the vessels fumigated had previously entered some other United States port and were remanded to Philadelphia for fumigation. In addition, 54 vessels were remanded from United States ports via Philadelphia to other United States ports.

*New Orleans, La.*—Surg. D. C. Turnipseed in charge.

On November 14, 1925, the headquarters of the station was removed from quarantine, Louisiana, to the city of New Orleans. Coincident with this transfer the activities of the city station were considerably increased at the expense of the station at quarantine,



Louisiana, so that at present most of the vessels from foreign ports are boarded and inspected at the Flood Street station in the city of New Orleans.

During the close quarantine season (April 1 to November 1) the temperature of all persons arriving from ports in the zone where yellow fever may be present is taken, and all persons with fever which can not be otherwise explained are removed to Marine Hospital No. 14 for observation and diagnosis.

All vessels with sickness on board are required to stop for quarantine inspection at the lower station, 90 miles down the river. Certain vessels carrying perishable cargo which would ordinarily arrive at New Orleans after sundown are, upon request, inspected at the lower station between the hours of 7 a. m. and 3 p. m. This latter procedure affords the fruit-shipping interests a 24-hour boarding schedule and eliminates the necessity for night inspection during the close quarantine season.

When New Orleans was declared free from plague infection on October 1, 1925, the supervision of the fumigation of vessels, which had been administered as a part of outgoing quarantine measures, was returned to the medical officer in charge of the quarantine station.

Two vessels arrived with smallpox on board. In both instances the patients were removed and isolated until recovered. All members of the crew not showing evidence of recent successful vaccination were vaccinated and detained until immune reactions or evidence of successful vaccination appeared. The quarters occupied by the patients on board the vessels were fumigated.

Three lepers who had absconded from Carville, La., were detained at quarantine, Louisiana, from July 1 to November 1, 1925.

*New York, N. Y.*—Surg. Carroll Fox in charge. Post-office and telegraphic address, Rosebank, Staten Island, N. Y.

Scientific studies inaugurated in previous years have been continued and additional research undertaken with the aim of improving quarantine procedure and technique.

Hoffman Island, situated in the lower bay 3 miles below quarantine headquarters, has been maintained for the purpose of hospitalization, delousing, and detention. Swinburne Island has remained inactive for two years, and should it be required for detention and isolation much time and money would be consumed in getting it ready. Additional personnel would also be required to operate it.

Port sanitary statements are issued from the station office at the customhouse, New York City, N. Y.

#### ADMINISTRATION

The major activities of the station are effected through three divisions—boarding, fumigation, and laboratory.

*Station personnel*

Classification	On duty June 30, 1925	On duty June 30, 1926
Commissioned officers.....	3	3
Acting assistant surgeons.....	11	10
Pharmacists.....	2	2
Consulting bacteriologist.....	1	1
Nurses.....	2	2
Clerks.....	9	9
Pilots.....	3	3
Marine engineers.....	4	4
Other employees.....	132	111
Total.....	167	145

It will be seen that there has been a reduction of 22 in the number of employees during the year.

After 33 years and 4 months' service at the New York Quarantine Station, Senior Pilot James J. Dillon died on May 17, 1926. Captain Dillon was employed by the State of New York from September 1, 1892, until the quarantine station was transferred to the Public Health Service on March 1, 1921. From that date until his death he was employed continuously by the service.

The old wharf on the north side of the reservation was replaced by a new L-shaped pier and the basin was dredged to a depth of 12 feet at mean low tide.

The old frame and galvanized sheet iron sheds on the south side of the Rosebank Reservation have been replaced by new concrete one-story warehouses, constructed by station labor from material purchased for this purpose. These buildings are a valuable addition to the station equipment, affording better protection and greater security to the property stored therein, as well as greatly improving the appearance of that section of the reservation.

A new fire-resisting roof was installed on building No. 1, Rosebank. Rooms in building No. 7, Rosebank, were papered or painted, as were a number of rooms in building No. 2, Rosebank, quarters Nos. 2 and 3.

The tug *Pyxie* was rechristened *Henry R. Carter* by bureau order.

The tug *Beetle* was transferred from the Shipping Board and arrived at the station on June 3, 1926.

The coal dock at Hoffman Island was repaired and is now in good condition for storage of coal.

A new flagpole was erected at Hoffman Island.

Minor repairs were made to the walls and chimneys of brick buildings, and the frame isolation hospital building at the island was painted both inside and out by the station force during the past winter and spring.

## BOARDING DIVISION

The personnel regularly assigned to the boarding division consists of five medical officers, two of whom are detailed from Ellis Island for the medical inspection of aliens, two male and two female inspectors. From time to time during the year medical officers temporarily assigned to the station have been detailed to the boarding division for instruction and training.

Although 1,348 vessels arrived from ports in which quarantinable diseases were known to exist, no case of quarantinable disease was detected, nor were any vessels detained. A total of 16 persons—11 seamen and 5 passengers—was removed from vessels because of suspected quarantinable disease—5 for smallpox, 2 for plague, 4 for leprosy, 1 for yellow fever, and 4 for typhus. These, however, after further study and observation, were released as negatives. Eighty-six persons showing evidence of body-lice infestation were bathed and disinfected on board vessels.

## FUMIGATION DIVISION

The personnel of the fumigation division consists of a medical officer in charge of the division, 3 medical officers in charge of fumigating crews, 1 assistant sanitary inspector in charge of a crew, 1 clerk, 1 messenger, 4 fumigating crews comprising 4 assistant foremen and 19 fumigators, and a trapping crew of 1 foreman and 3 men.

*Fumigation.*—Vessels aggregating approximately 4,148,760 net tons were fumigated. Hydrocyanic acid gas was used exclusively, the following methods being used:

## Barrel generation method:

Hydrocyanic acid gas, straight	60 vessels.
Hydrocyanic acid-cyanogen chloride mixture	789 vessels.
Liquid hydrocyanic acid-cyanogen chloride mixture	308 vessels.
Zyklon-B (hydrocyanic acid plus tear gas)	22 vessels.

The 10,144 rats found after fumigation were distributed as follows:

Mess and ship's stores	1,081, or 10.65 per cent.
Holds and all cargo spaces	7,231, or 71.29 per cent.
Crew's quarters and staterooms	230, or 2.27 per cent.
Other superstructures	1,602, or 15.79 per cent.

If the term "superstructure" be taken to mean quarters, staterooms, chart rooms, and such compartments as are actually on or above the main deck, it will be seen that 1,832 rats, or 18.06 per cent, were recovered from the superstructures, and 8,312, or 81.94 per cent, were recovered from the holds, cargo spaces, and ship's storerooms.

Experience gained in routine fumigation by experimental work with cyanogen products indicates that the "barrel generation" method of hydrocyanic acid gas fumigation is less efficient than the liquid hydrocyanic acid gas mixture or Zyklon-B. The amount of hydrocyanic acid gas evolved when sodium cyanide and sodium chlorate are added to a mixture of hydrochloric acid and water varies considerably. Further important considerations are the difficulty of handling and transporting the equipment required for the generation of gas and the greater number of persons required for conducting the fumigation.

With the improvement in the mechanical equipment used for fumigating with liquid cyanide mixtures and with larger amounts of this material available, the number of vessels fumigated by this method increased steadily throughout the year. Considered solely as a lethal agent, liquid hydrocyanic acid gas introduced into vessels by means

<sup>2</sup> Fifty-nine supervised and one fumigated by station.

of a well-designed spray apparatus is the agent of choice. With the mechanical equipment now used it is impossible to regulate the doses for small compartments accurately, so that its use in sleeping quarters and staterooms is hazardous because of liability of overdosing. There is probably a certain element of danger of spontaneous decomposition due to exothermic polymerization in handling liquid cyanide. Certain of the liquid cyanide manufacturers have discontinued the practice of shipping this material by common carrier. At this station the liquid gas is transported to the vessel to be fumigated by boat.

Zyklon-B, a product of German manufacture, consisting of liquid hydrocyanic acid incorporated in a calcined and granulated silicious earth, has been studied intensively. From the standpoints of convenience, ease of handling, and safety to the public and fumigators Zyklon-B represents a distinct advance in cyanide fumigation. Small compartments can be dosed with accuracy.

*Trapping.*—Trapping was carried on by one crew consisting of a foreman and three men. Vessels subject to rat-proofing surveys were trapped for the purpose of controlling the work in progress. Other vessels, whose records showed a high rat infestation, were trapped both before and after fumigation. Double-action snap traps were used in the proportion of 60 traps per 1,000 net tons.

A large number of cage traps were used on the piers in order to secure live rats for the flea survey conducted by the laboratory division. The results of pier trapping have been discouraging. The only two vessels trapped before fumigating yielded 25 rats. Subsequent fumigation of these vessels yielded 67 rats; 2,332 rats were recovered by trapping 769 ships which were not treated by fumigation; 179 vessels were trapped immediately after being fumigated; 2,325 rats were recovered by fumigation, and subsequent trapping yielded 531 rats; that is, 2,888 rats were trapped on 950 vessels, distributed as follows:

Mess and ship's stores.....	248, or 8.59 per cent.
Holds and all cargo spaces.....	2,159, or 74.76 per cent.
Crews' quarters and staterooms.....	94, or 3.23 per cent.
Superstructures.....	387, or 13.43 per cent.

If the term "superstructure" be taken to mean quarters, staterooms, chart rooms, and other compartments on or above the main deck, it will be seen that 481 rats, or 16.66 per cent, were recovered from the superstructure and 2,407, or 83.34 per cent, from the holds and cargo spaces and ship's storerooms.

It is believed that careful trapping of vessels will serve as an index of rat infestation. Rat-infested vessels which for any reason can not be fumigated should be thoroughly and completely trapped while in port.

#### RAT-PROOFING OF VESSELS

The rat-proofing of vessels, inaugurated at this station about 18 months ago, has progressed steadily and satisfactorily. Seventy-four vessels, representing some of the most important steamship lines entering the port, have been surveyed and work is in progress on 26 of this number. All of these are large passenger vessels and among the list are six of the largest and finest vessels in the world. In addition to the United States lines, the most important English, Norwegian, Swedish, Danish, German, Italian, and Dutch companies



are cooperating. Rat-proofing is carried on not only in New York but in Southampton, Bremen, Dantzic, Buenos Aires, Gothenburg, and Bergen. Realizing that more efficient and economical work is done by trained workmen, several of the companies maintain regular crews of mechanics and carpenters who work on the different ships while in port, rat-proofing under the direct supervision of service inspectors. Follow-up inspections are carefully and thoroughly made on each return to New York, so that satisfactory progress is insured and important data are collected and recorded with reference to variations in rat infestation and activity on board during each trip. The ships' officers maintain a special log of rats trapped or killed and those seen or heard by members of the crew, and this information, together with that obtained at previous surveys, is used by the inspector in checking the results of the rat-proofing.

The results of rat-proofing are illustrated in the case of a 50,000-ton passenger vessel plying regularly between New York and England. On this vessel, which is now approximately 55 per cent rat proof, rat trapping was practiced for about one year before rat-proofing was inaugurated. The average yield was 50 rats per round trip voyage. During the period of more than one year since rat-proofing was begun, the rat catch on this vessel has progressively decreased and for several voyages has averaged less than six rats without fumigation or other rat eradivative measures.

Numerous inspections of rat-proofed sections of vessels indicate that if rat-proofing has been done exactly in accordance with specifications, rats have been eliminated from the treated sections and they do not reappear even though they are definitely known to flourish in other parts of the same vessel. The provision store-room, cold-storage plant, and baggage room, all of which communicated with one of the after holds of a certain 11,000-ton passenger vessel, were rat infested. In spite of periodic fumigation the ship's crew trapped an average of 20 rats per trip. A careful survey of this vessel showed much evidence of rat harboring and nesting in the after section and 80 rats were uncovered and killed during the process of rat-proofing. Intensive rat-proofing measures, embracing the elimination of rat-harboring places, were carried out and after seven months the most rigid inspections each time the vessel comes to New York fail to disclose evidence of rat reinfestation. Even if rats should enter the vessel, harboring and breeding would be discouraged, as conditions favorable to rat life have been eliminated. Similar satisfactory results have been reported from many other vessels.

A large-scale cross-section model of a ship, showing on one side typical conditions favoring rat life, harborage, and activity and on the other corrections of such conditions, was prepared at this station and is now being exhibited at the Sesquicentennial Exposition at Philadelphia, Pa.

#### LABORATORY DIVISION

On July 27, 1925, Surg. C. L. Williams was placed in charge of the laboratory. As station work would permit other officers were assigned to the laboratory as assistants and for special duty.

A survey of the fleas obtained from rats trapped along the water front is being made. This survey has already demonstrated that

rats are relatively few in number on the docks, less than one rat being captured per 100 traps set. All fleas examined were *Ceratophyllus fasciatus*.

A survey of the fleas obtained from rats fumigated or trapped on ships has been inaugurated. A record is kept of the ship, the ports visited, the cargo carried, the number and species of rats, and the number and species of fleas. Although there are a number of causes of error inherent in this method, the principal one being due to fleas leaving the rats during the process of fumigation, it yet furnishes certain data of considerable value. It has been noted that the rats on ships running between New York and north European ports (north of Spain) are infested almost exclusively with *C. fasciatus*, while on all other ships *X. cheopis* predominates. The survey has shown that fleas are much more numerous on ship rats in warm weather than in cold. This applies to ships coming from tropical ports as well as to those from cold climates. Eight species of fleas have been taken from ship rats with *X. cheopis* markedly predominating, *C. fasciatus* next, and all others in negligible numbers.

The fact that ship rat fleas are almost exclusively *X. cheopis* and *C. fasciatus* is strong evidence of their superior adaptability with consequent wide distribution as compared with other species. It appears that, as far as plague in rats is concerned, we may confine our flea investigations to these two species.

The records show that both fleas and rats are affected by the ports visited and the cargoes. Vessels from the Orient, those continuously traveling around the world, those in the trade with the east coast of South America, and those running to tropical ports in general have more rats and fleas than ships on other routes. Fruit ships have the most rats and fleas and tankers (all cargoes) the least. Sugar ships, while infested with about the average number of rats, carry very few fleas.

Surg. C. V. Akin and Acting Asst. Surg. G. C. Sherrard were engaged in a special investigation of the relative merits of the several cyanogen products used and the methods followed in ship fumigation from the standpoints of (1) killing efficiency; (2) safety to the public and fumigators; and (3) cost. If lethal efficiency only be considered, the cyanogen products tested stand in the following order:

- (1) Liquid hydrocyanic acid (96-98 per cent) straight.
- (2) Liquid hydrocyanic acid (96-98 per cent) to which is added 20 per cent of liquid cyanogen chloride for "tear effect."
- (3) Zyklon-B, a product of German manufacture, consisting of a measured amount of liquid hydrocyanic acid plus varying percentages of "tear gas" incorporated in a granulated, calcined, silicious earth "diatomite."
- (4) Hydrocyanic acid gas generated by mixing sodium cyanide with sulphuric acid and water.
- (5) Hydrocyanic acid-cyanogen chloride mixture generated by mixing sodium cyanide and sodium chlorate with hydrocyanic acid and water.
- (6) "Calcium cyanide," a product of American manufacture, one-half of which, by weight, is hydrocyanic acid, liberating gaseous hydrocyanic acid when acted on by atmospheric moisture.

NOTE.—Numbers 1, 2, and 3 are approximately equal as killing agents, variations noted being due in all probability to the amounts of hydrocyanic acid gas actually introduced.

If accuracy of dosage and safety of handling are considered, Zyklon-B is superior to all other cyanogen products tested and used on this station. The initial cost of liquid hydrocyanic acid-cyanogen chlorate mixture and Zyklon-B is practically the same. Theoretically the "barrel generation" method, using sodium cyanide and sodium chlorate with a mixture of hydrochloric acid and water, is cheapest, but when the expenses for extra labor, equipment, transportation, and loss of ship time are considered no saving can be demonstrated. Of even greater importance is the fact that the "barrel generation" method produces an extremely variable amount of hydrocyanic acid gas with a relative efficiency of approximately one-fourth that of liquid hydrocyanic acid or Zyklon-B.

The use of Zyklon-B for superstructure compartments and liquid hydrocyanic acid for holds is ideal for large stations with trained personnel.

Zyklon-B has many advantages and is recommended for smaller stations because it is safer than the "barrel generation" method.

*Laboratory division transactions*

Total rats examined	12,987
Total fleas examined	3,268
Guinea-pig inoculations	1,203
Rats found plague infected	0
Weil-Felix reactions performed (positive)	3
Weil-Felix reactions performed (negative)	32
Smallpox vaccinations performed	173
Smallpox vaccinations inspected and cards issued	137
Blood counts made	24
Blood smears examined	26
Buboes punctured, suspected plague (negative)	2
Tissue smears examined for leprosy (negative)	8
Specimens of urine examined for clinical diagnosis	55
Tests for Widal reaction	11
Cultures examined for diphtheria	7
Sputum examined for tuberculosis	6
Triple typhoid vaccination administered	1
Vessels boarded by laboratory officers	69
Consultations in cases outside of service work	8
Diphtheria culture tested for virulence	1
Cultures examined for meningitis	88

HOSPITAL, DETENTION AND DELOUSING

The personnel attached to Hoffman Island was reduced from 63 to 32.

Nineteen seamen, 16 with measles and 3 with chicken pox, were transferred from Marine Hospital No. 21 at Stapleton, Staten Island, N. Y.

<sup>3</sup> Classification of fleas:

Fleas from rats fumigated and trapped on vessels—	2,623
<i>Xenopsylla cheopis</i>	27
<i>Xenopsylla astia</i>	4
<i>Xenopsylla brasiliensis</i>	546
<i>Ceratophyllus fasciatus</i>	4
<i>Ceratophyllus</i> sp.	17
<i>Leptopsylla musculi</i>	7
<i>Ctenocephalus canis</i>	1
<i>Pulex irritans</i>	
	3,229
Fleas from rats trapped on piers— <i>Ceratophyllus fasciatus</i>	39
Total fleas	3,268

*Hoffman Island transactions*

Passengers detained (including 4 for delousing)-----	5
Seamen detained-----	5
Total days detained-----	20
Seamen in hospital-----	19
Total hospital days-----	211
Pieces of baggage fumigated-----	13

## GENERAL

A number of officers have been assigned to the station temporarily for training in quarantine procedure before being detailed to duty at foreign ports. All of the medical officers regularly assigned to the station have been given opportunities to familiarize themselves with the major activities of the station.

*Pensacola, Fla.*—Acting Asst. Surg. C. W. D'Alemberte in charge.

On June 30, 1926, the American barge *George T. Loche* arrived at Pensacola Quarantine Station three and one-half days from Frontera, Mexico, with a cargo of bananas. One member of the crew was found to have a temperature of 38.6° C. and gave a history of having had a chill on the night of June 28. The crew of the barge was removed to the Pensacola Quarantine Station, and the barge was fumigated for the destruction of mosquitoes and released. Routine laboratory examinations of the patient were negative, and on the 2d day of July the men were released from quarantine, as the temperatures of all were normal, and a diagnosis of influenza was made in the case of the member of the crew who showed a rise of temperature upon arrival in port.

*Perth Amboy, N. J.*—Acting Asst. Surg. Charles W. Naulty, jr., in charge.

On June 29, 1926, a conference to discuss the matter of the quarantine anchorage was held in the office of the district Army Engineer. It is expected that a new channel, 400 feet wide and 30 feet deep, will be dredged in the harbor, to be completed in about two years, and that a channel, 200 feet wide and 30 feet deep, will be ready for use soon. The channel will be marked by gas buoys and permanent beacons, so that it may be used at night.

*Port Townsend, Wash.*—Surg. W. A. Korn in charge.

The S. S. *Wheatland Montana* arrived at Port Townsend January 15, 1926, from Shanghai, China. En route, one member of the crew died and was buried at sea. From the history obtained from the master of the vessel the disease evidently was smallpox.

The vessel was remanded to Diamond Point Quarantine Station, where appropriate measures were taken, and the entire crew of 37 vaccinated. The vessel later was released, but eight of the crew were detained for observation. Two days later, one of those detained, an oiler, who had never been vaccinated, developed hemorrhagic smallpox, ending in death. No further cases occurred.

*Providence, R. I.*—Senior Surg. H. S. Mathewson in charge. Post-office and telegraphic address, 403 Federal Building.

In August, 1914, the former cruiser *Newark* was brought to Providence and arranged for the housing of persons detained in quarantine. The *Newark* remained in Providence Harbor until May, 1918, when it was returned to the Navy for use as a hospital ship during



the war. The vessel was returned to Providence for the use of the Quarantine Service in June, 1919. Late in 1925 it was recommended that the *Newark* be returned to the Navy Department and that vessels whose personnel had to be detained be remanded to the quarantine station at Boston or New York. In February, 1926, a naval board inspected the *Newark* and made recommendations for its disposition. A board of medical officers of the Public Health Service was convened at Providence on May 4, 1926, to dispose of the property of that service still on board the *Newark*. This property having been disposed of June 28, 1926, by transfer to other stations of the service, the hulk was turned over to the Navy Department on July 2, 1926, and was towed to the naval training station, Newport, R. I.

The remaining floating property of the station, consisting of the launch *Hugh Ward* and the small unnamed launch, was removed to the New York Quarantine Station by the service tug *Henry R. Carter*.

*Sabine, Tex.*—Surg. A. R. Sweeney in charge. Post-office and telegraphic address, Port Arthur, Tex.

The Lake Sabine district comprises the ports of Beaumont, Port Arthur, Orange, Port Neches, Sabine, Sabine Pass, and other small ports situated on the Sabine River, Sabine Lake, and the Neches River. Recently Lake Charles, La., has been added. The ports of the district are scattered along 90 miles of natural and artificial waterway, all connecting with Sabine Pass.

The deep-water ship canal which connects the ports of the district has a combined length of 53 miles. The first portion, 20 miles in length, runs from Sabine Pass and connects with the Neches River at its outlet into Lake Sabine. The second portion runs from the mouth of the Neches River to the mouth of the Sabine River as the Sabine debouches into the Sabine Lake. This portion is 8 miles in length. The third portion of the canal runs from the Sabine River just below Orange, Tex., to the Calcasieu River and is 25 miles in length.

The towns of Sabine and Sabine Pass are situated on Sabine Pass; Port Arthur is situated on the deep-water canal, approximately 15 miles from Sabine Pass; Port Neches is situated on the Neches River, 25 miles from Sabine Pass; Beaumont is situated on the Port Neches River, approximately 35 miles from Sabine Pass; Orange is situated on the Sabine River, 35 miles from Sabine Pass; Lake Charles, La., is situated on the Calcasieu River, approximately 75 miles from Sabine Pass.

Three vessels entered the ports of the district with smallpox on board: The American schooner *City of Portland* from Miami, Fla., February 20, 1926, with two cases; the American tanker *Aryan* from New York, April 19, 1926, with one case; and the American tanker *Gulfstream* from New Orleans, April 26, 1926, with one case. The sick men were isolated, all other persons vaccinated, and the vessels were disinfected with formaldehyde permanganate. No secondary cases were reported.

Port sanitary statements were issued as follows:

1. Showing compliance with provisional pratique:

Beaumont	534
Port Arthur	1,026
Sabine	139
Orange	49

## 2. Showing noncompliance with provisional pratique:

Beaumont	4
Port Arthur	2
Inspections to ascertain compliance with provisional pratique:	
Port Arthur	3,940
Beaumont	2,524
Orange	69
Port Neches	39

*San Diego, Calif.*—Surg. J. F. Worley in charge. Post-office address, Point Loma, Calif.; telegraphic address, San Diego, Calif.

One coastwise vessel entered port with a case of smallpox on board. The sick man applied at the relief station for treatment and was sent to the isolation hospital. The longshoremen who had been discharging the cargo of the vessel were vaccinated by the city health officer. The vessel was sent to the quarantine station, where the compartments occupied by the patient were disinfected and all of the crew were vaccinated. As all but 8 of the crew showed immune reactions within 72 hours, the vessel was remanded to San Pedro under provisional pratique.

*San Francisco, Calif.*—Surg. R. H. Creel in charge. Post-office and telegraphic address, Angel Island, Calif.

Seven vessels potentially infected with quarantinable diseases arrived at quarantine. Two of the vessels had leprosy on board and five had smallpox infection. The lepers were isolated at the quarantine station and later returned to the port of embarkation. Of the vessels infected with smallpox, one was from Europe by way of the Panama Canal, and the other four were from the Orient. The usual preventive measures, provided in the regulations, were applied against the smallpox-infected vessels. The sick persons, and those passengers and seamen who had been in contact with the sick, were isolated at the quarantine station. Of the latter group, however, those who upon vaccination showed evidence of immunity were released. The utilization of the immune reaction as a means of releasing contacts at an early date proved to be of considerable advantage. When the station had advance notice of a case of smallpox on board an approaching vessel, the ship's physician was advised by radio to vaccinate contacts approximately 36 hours before arrival, so that it was possible to release a number of such contacts at the time of quarantine inspection.

It is of interest to note that of the trans-Pacific passenger vessels the Japanese liners have been exceptionally free from smallpox infection, both among the crew and the passengers. This condition of affairs can very probably be ascribed to the enforcement of vaccination among crew and passengers on these vessels. In contrast to this, there has been in the past few years quite a number of infected American vessels from oriental ports. The subject was taken up with the shipping interests concerned, and more effective measures have been undertaken to prevent the development or extension of smallpox infection on board trans-Pacific liners. Routine vaccination is being performed on members of the crews by ships' physicians, and stricter attention is being paid at the ports of embarkation by service representatives to the provisions of paragraph 108, United States Quarantine Regulations. In most of the cases of smallpox

developing on trans-Pacific vessels in recent years the infection has apparently been contracted at Hongkong or Shanghai, chiefly the latter port.

Service operations at this port to prevent the introduction of plague have been carried on with the same activity as in former years. There were fumigated for the destruction of rats 514 vessels; 437 by cyanogen-chloride, 50 by hydrogen-cyanide, and 27 by sulphur dioxide. A total of 1,837 rats was recovered as a result of the fumigations and delivered to the laboratory for autopsy. None was found to be infected. Of the rats killed by fumigation 902 were *Mus alexandrinus*, 920 *Mus rattus*, and 15 *Mus norvegicus*; 372 mice were also picked up, although no special attention was paid to the recovery of this species. The comparative absence of the *Mus norvegicus* on board vessels is in keeping with previous observations that the Norway rat is but rarely found on overseas shipping. Of the total number of rats recovered 1,080 were from the holds of vessels, 299 from storerooms, 58 from crews' quarters, and 390 from other superstructures, chiefly poop deck, lifeboats, and portable lockers for storing boat falls. Practically no rats were found in first-class passenger accommodations. Of the vessels fumigated approximately 280 were direct from plague-infected ports of the Orient or South America. The remainder of those fumigated were treated in accordance with the provisions of the quarantine regulations pertaining to periodic fumigation, or in conformity with outgoing quarantine restrictions in Oakland. In September, 1925, however, the restrictions against Oakland were discontinued. Of the total number of vessels fumigated no rats were recovered from 356. To some extent negative result was due to some of the vessels being partially cargo laden and thorough search not practicable. Of this group, however, a very considerable number was apparently rat-free, due, no doubt, to the repeated routine fumigation of regular line vessels entering San Francisco.

Routine trapping of vessels was not practicable because of the lack of personnel, but an occasional vessel was trapped subsequent to fumigation as a means of checking the effectiveness of the fumigation. Trapping operations generally cover a period of three days, an average of 150 snap traps being used. On one vessel only were rats trapped subsequent to fumigation, four rats being taken in this manner after a fumigation that had destroyed 32 rats. It is thought possible that the surviving rodents had escaped destruction by hiding in deck structures or material.

A liquid mixture of hydrogen cyanide and cyanogen chloride has been extensively used throughout the year with very satisfactory results. This method has an advantage over the "barrel method," in that it can be performed with less apparatus and with smaller personnel. The liquid product, however, is somewhat more costly than the generation of gas by the "barrel method." The impracticability of maintaining a large amount of liquid on the station, so as to be assured at all times of an adequate supply, is the one feature that militates against discontinuance of the "barrel method" of generating gas, and for this reason both methods are being used at the San Francisco quarantine station.

The provisions of the regulations to prevent the introduction of anthrax-infected shaving brushes have been carefully observed.

#### PHYSICAL IMPROVEMENT

Relations with other services on Angel Island and the San Francisco waterfront have continued to be marked by cordiality and spirit of mutual helpfulness. This station has been indebted to the Immigration Service for the transportation of passengers and freight from San Francisco, and in turn has been able to reciprocate through the loan of the quarantine steamer *R. M. Woodward* for the use of the Immigration Service when the regular immigration steamer was out of commission. On several occasions the buildings of the immigration station were fumigated for the destruction of vermin, more especially roaches and bed bugs. The quarantine service at this port has also been indebted to the collector of customs for boarding facilities when the *R. M. Woodward* was out of commission. There was also received valuable assistance from the near-by Army post, Fort McDowell.

*San Pedro, Calif.*—Surg. H. A. Spencer in charge.

One vessel, the American S. S. *George Olsen*, arrived at San Diego with a case of smallpox on board. The sick man was removed at that port, all personnel were vaccinated, and the vessel permitted to proceed to San Pedro. Those who had not shown immune reactions were revaccinated and all but three were released. The British S. S. *Empress of Scotland*, which was making a round-the-world cruise, arrived at San Francisco with two cases of smallpox among the crew. The sick persons were isolated aboard, where they remained until after the departure of the vessel from San Pedro. Three passengers refused vaccination. Two were not allowed shore leave at this port and continued with the vessel. One disembarked under the supervision of the local health officer. So far as has been learned, no subsequent cases developed on either vessel.

#### *Classification and location of rats recovered after fumigation of vessels*

Species	Holds	Provision storeroom	Peaks and lazarettes	Living quarters, etc.	Total
<i>Mus alexandrinus</i> .....	214	13	4	15	246
<i>Mus rattus</i> .....	385	19	10	42	456
<i>Mus norvegicus</i> .....	1	0	0	1	2
<i>Mus musculus</i> .....	25	2	37	2	66

The barge *Disinfector*, formerly used for storage, was sold at public auction on October 17, 1925.

The hull of the launch *S. D. Brooks* was thoroughly overhauled and a new 45-horsepower full Diesel, 3-cylinder, 2-cycle engine was installed, a dependable boat resulting.



## TEXAS BORDER STATIONS

*Quarantine transactions on the Texas-Mexican border for the fiscal year ended June 30, 1926*

	Brownsville	Del Rio	Eagle Pass	El Paso	Hidalgo	Laredo	Presidio	Rio Grande and Roma <sup>1</sup>	Total
Number inspected from interior Mexico.....	1,371	2,270	3,076	27,318	2,023	28,189	75	2,887	67,209
Number of local passengers inspected.....	853,503	110,167	763,886	2,445,375	28,115	1,070,330	12,617	34,853	5,318,846
Total number of passengers inspected.....	854,874	112,437	766,962	2,472,693	30,138	1,098,519	12,692	37,740	5,386,055
Total number of persons disinfected.....	290	243	7,178	40,351	36	10,762	0	126	58,986
Total number of persons passed without treatment.....	850,892	111,280	759,784	2,414,939	29,776	1,060,259	12,496	33,232	5,272,658
Total number of persons vaccinated.....	3,684	893	2,370	17,377	301	38,260	177	2,398	65,460
Total number of sick held for observation.....	0	17	0	0	0	0	0	0	17
Total number of sick refused admission.....	8	4	118	26	25	0	19	0	200
Total pieces of baggage disinfected.....	296	551	8,723	6,599	0	8,307	61	219	24,756

<sup>1</sup> Two cases typhus at Rio Grande, Tex.

*El Paso, Tex.*—Surg. J. G. Wilson in charge.

As heretofore, particular attention has been given to preventing the introduction of typhus fever and smallpox. Vaccination against smallpox is maintained constantly. The inspectors on duty on the international bridge are trained in vaccinating, and aliens who do not present evidence of immunity to smallpox are vaccinated. Although smallpox has been present constantly in Chihuahua and other Mexican States, whence many of the immigrants come, no cases of smallpox have been reported in El Paso during the past year. Four cases of typhus fever, which, however, could not be definitely traced to Mexico, were reported in El Paso during the spring of 1926. About 200 contacts, with their clothing, bedding, and other baggage, were disinfested at the service-disinfesting plant.

Travelers who were obviously clean and not louse-infested were permitted to pass without bathing in the disinfesting plant, but persons who corresponded to the steerage class at seaports of entry were bathed, their clothing and baggage disinfested and, if necessary, they were vaccinated. The working people from Juarez termed "locals" were required to bathe once each week. Bath certificates were issued by inspectors on duty in the bathhouse and taken up after eight days, a new one being issued after each disinfestation.

*Laredo, Tex.*—Acting Asst. Surg. Nat K. King in charge.

The activities of this station have been directed principally against the introduction of smallpox and typhus into the United States. In order to carry on the work of delousing the persons and clothing of travelers who have been found to be infested, a new disinfesting plant, situated at the international foot and wagon bridge, was leased. Five hundred or more persons can be disinfested daily without interfering with the regular inspection of travelers.

Since no case of yellow fever had been reported from Mexico during the past year, the stegomyia control work was discontinued on June 30, 1926. At present, the stegomyia index in Laredo is so low that it is probable that yellow fever would not spread even if a case should be imported.

*Presidio, Tex.*—Acting Asst. Surg. C. M. Hatcher in charge.

The hot-air sterilizer added to the station equipment during the year is a great improvement over the box formerly used for disinfecting baggage with formaldehyde.

*Rio Grande and Roma, Tex.*—Acting Asst. Surg. C. J. Martin in charge.

Hot-air sterilizers, which were installed at both Rio Grande City and Roma, have been used to good advantage. One case of leprosy and two of typhus fever, which had developed in Starr County, Tex., were diagnosed and turned over to the county health officer.

The spread of smallpox from Camargo, Mexico, where it was epidemic, to the United States was successfully resisted.

### TRANSACTIONS AT INSULAR QUARANTINE STATIONS

*Summary of transactions at insular stations for fiscal year ended June 30, 1926*

	Vessels inspected	Vessels fumigated	Passengers and crew inspected	Bills of health issued
Aguadilla, P. R.	5	0	58	25
Ahukini, Hawaii	2	0	51	0
Arecibo, P. R.	0	0	0	29
Arroyo, P. R.	10	0	107	23
Cavite, P. I.	28	0	4,264	13
Cebu, P. I.	94	234	9,533	267
Central Aguirre, P. R.	0	0	0	17
Christiansted, Virgin Islands	16	0	125	0
Davao, P. I.	18	0	1,608	25
Fajardo, P. R.	16	0	102	230
Frederiksted, Virgin Islands	40	0	2,536	0
Guanica, P. R.	174	3	10,946	37
Hilo, Hawaii	25	4	4,428	0
Honolulu, Hawaii	595	36	149,684	21
Humacao, P. R.	26	0	274	35
Iloilo, P. I.	39	121	7,573	189
Jolo, P. I.	40	0	4,990	73
Kahuli, Hawaii	17	0	549	0
Koloa, Hawaii	4	0	104	0
Lahaina, Hawaii	6	0	222	0
Legaspi, P. I.	3	0	126	3
Mahukana, Hawaii	3	0	68	0
Manila, P. I.	854	225	133,969	970
Mayaguez, P. R.	31	0	407	36
Olongapo, P. I.	1	0	44	1
Ponce, P. R.	144	2	4,125	72
St. Thomas, Virgin Islands	258	21	12,336	0
San Juan, P. R.	383	50	25,129	775
Zamboanga, P. I.	36	0	5,056	139
Total	2,868	696	378,414	2,980

<sup>1</sup> Recently made a port of entry.

### REPORTS FROM INSULAR QUARANTINE STATIONS

#### OPERATIONS OF THE SERVICE IN HAWAII

Surg. Hugh de Valin, chief quarantine officer. Post office and telegraphic address, Honolulu, Hawaii.

Only one quarantine station is maintained in the Hawaiian Islands, that at Honolulu, but vessels are inspected at the subports of Hilo, Mahukona, Koloa, Ahukini, Lahaina, and Kahului.

## SMALLPOX MEASURES

As anticipated, the avirulent type of smallpox which had prevailed in the Pacific Coast States for some time, assumed during the winter months a more serious aspect, the disease attaining a mortality of 20 per cent in the city of Los Angeles, where over a thousand cases were recorded between January 1 and June 1. Regulations requiring the vaccination of passengers and crew embarking for Hawaii were put into effect on April 5, 1926, and were continued until June 17. Similar regulations had been in force during the 1925 epidemic, their enforcement devolving upon the surgeons of the various steamships. The results at that time were not all that could be desired. In the hurry of departure it was found difficult to vaccinate, and quite naturally it was found equally difficult to examine and vaccinate passengers during the first two or three days of the voyage. As a consequence, most of the vaccinations were performed shortly before arrival at Honolulu, thus affording the community but little protection.

A more satisfactory arrangement was made for the enforcement of the regulations during the present fiscal year. Prospective passengers, before purchasing their tickets at the ports of San Francisco, Los Angeles, Seattle, and Vancouver, were referred by the steamship companies to service officers, where the necessary inspections were made and certificates of immunity issued, vaccination being performed when indicated. With the adoption of this system passengers were immunized prior to arrival, and the occasional misunderstandings which had arisen under the old system were avoided.

That the enforcement of reasonable vaccination regulations, coupled with careful inspection at quarantine, has achieved results is borne out by the fact that no case of smallpox has developed in Hawaii in the past several years, although as many as 30 cases have been detected at quarantine or have occurred on vessels en route to or from the islands.

Smallpox was reported as follows: The *S. S. Carinthia*, on an around-the-world cruise, developed a case prior to arrival at Yokohama in the person of a first-class passenger, who probably had contracted the infection in California. Similarly, a member of the crew of the *S. S. Manoa* departing from Honolulu on December 16 became ill the day of departure, and the case was diagnosed smallpox upon arrival at the San Francisco quarantine station, the infection almost certainly having originated in California. On the *S. S. Empress of Scotland*, subsequent to sailing from Honolulu, two mild cases developed, the contacts being handled at San Francisco. On the *S. S. Sierra*, arriving from the latter port on April 13, an unvaccinated cabin passenger became ill with confluent smallpox, necessitating the detention of 25 contacts until evidence of immunity could be obtained.

On November 26, upon the arrival of the *S. S. President Lincoln* in port, the immigration authorities discovered 11 Chinese stowaways on board. These men were landed without quarantine inspection. The following day one of the stowaways, who probably had been ill for several days, was referred to the Queen's Hospital for treatment. Upon admission the hospital staff noted the presence of a petechial rash in the groins and axillæ, but its significance was

left undetermined. Death occurred six hours after admission. A diagnosis of hemorrhagic smallpox (*purpura variolosa*) was immediately made and was confirmed by post-mortem examination. Energetic measures were at once instituted, and all possible contacts, fortunately few in number, were located and vaccinated. No secondary cases developed.

#### PRECAUTIONS AGAINST CHOLERA

The occurrence of cholera at Manila, Shanghai, Kobe, and Yokohama during the summer and fall months was the occasion for renewed vigilance at this port. The institution of outgoing quarantine measures, particularly at Manila and Yokohama, assured this station of some degree of safety, but considerable anxiety was felt over the possible introduction of a carrier. During the height of the epidemic shore liberty was denied steerage passengers and crews at foreign ports, and representatives of the service certified to the precautionary measures exercised. The rather low incidence of the disease at Asiatic ports, the close supervision exercised by the sanitary authorities, and the satisfactory conditions upon arriving vessels, were elements which precluded the necessity for the detention of vessels and the bacteriological examination of the personnel at this port, although had such a course been adopted, the margin of safety would have been greater. The fact that cholera carriers were detected at Kobe, Nagasaki, and Yokohama, on vessels from Chinese ports, and that the outbreak of the disease at Kobe and Yokohama was probably traceable to pollution of the harbor waters by undetected carriers, would seem to justify rigid precautionary measures elsewhere, even when such measures are accompanied by some delay and inconvenience to shipping.

The majority of the cases of cholera at Japanese ports appeared among those in close contact with the harbor, water front, and beaches. The geographical and occupational incidence of the disease was such that the sanitary authorities were agreed that the harbors had been seeded by carriers, and that the eating of products of these waters, particularly in an uncooked state, was the main responsible cause.

In this connection attention is invited to the possibility of introducing cholera into Honolulu in the same manner, although the size and conformity of the harbor are such that pollution of beach areas from vessels in the harbor is somewhat less likely than at certain other ports. However, there would be danger of pollution from the quarantine station, if cholera contacts should be detained. The sewage of the station, following septic-tank treatment, is discharged upon the reef, whence it is distributed over the contiguous tidal flats. These flats are a favorite fishing resort, and the products obtained, principally crabs, are usually eaten raw.

That this danger is not wholly theoretical is borne out by the cholera epidemic of 1895, which originated in this manner. On the afternoon of August 9 of that year, the *S. S. Belgic* arrived at Honolulu 12 days from Yokohama, the steerage passengers, 542 in number, being remanded to quarantine for detention. Isolation of the passengers was complete, but on the morning of August 20, two



cases of cholera appeared among women of the city who had gathered crabs from the tidal flats adjoining the station. Altogether 84 cases of cholera, with 64 deaths, resulted in the city from the infection thus introduced.

#### FUMIGATION OF VESSELS

A total of 40 vessels were fumigated during the year, 36 at Honolulu and 4 at Hilo. Four of the fumigations were of single compartments, one of which had been occupied by a smallpox patient, and the others by lepers. Fumigation for rats was done on 14 vessels, from which 291 rodents were taken. Two vessels arriving at Hilo from South America were fumigated for mosquitoes. The remaining 20 were vessels of the Army, Navy, and Coast and Geodetic Survey, fumigated at the request of Government departments for the destruction of vermin.

#### OPERATIONS OF THE SERVICE IN PORTO RICO

Surg. O. H. Cox in charge. Post office and telegraphic address, San Juan, P. R.

Toward the close of the fiscal year, a survey of the fleas infesting the rats of Porto Rico was begun. It is hoped to complete this survey during the next fiscal year.

The practice of fumigating cargoes of crated onions, potatoes, and similar products from the Canary Islands, the Azores, and other plague-infested territory has been continued.

#### OPERATIONS OF THE SERVICE IN THE VIRGIN ISLANDS

Surg. J. R. Hurley, chief quarantine officer. Post-office and telegraphic address, St. Thomas, V. I.

In addition to the principal office and detention station maintained at St. Thomas, there are two boarding stations operated on St. Croix, Virgin Islands. One at Frederiksted, in charge of Lieut. Roger A. Nolan (M. C.), United States Navy, and one at Christiansted, in charge of Lieut. H. E. Robins (M. C.), United States Navy. Both of these officers cooperate with the chief quarantine officer in all matters relating to quarantine procedures.

No quarantinable diseases have been encountered at any of the Virgin Islands ports during the year.

Smallpox, called *alastrim*, was reported unduly prevalent in certain islands of the French West Indies during the latter part of the year. Vaccination against smallpox was practiced at St. Thomas upon all arrivals from the French West Indies during the last three months of the year, also a campaign of vaccination was instituted in St. Thomas. The naval sanitation department vaccinated 736 school children, and the Public Health Service vaccinated a few persons presenting themselves at the quarantine office, and furnished the Navy with a quantity of vaccine virus to enable them to promptly complete their work.

A total of 43 persons were vaccinated by the quarantine service during the year.

## OPERATIONS OF THE SERVICE IN THE PHILIPPINE ISLANDS

Surg. H. F. Smith, chief quarantine officer. Post-office address, P. O. Box 424, Manila, P. I.; office, customhouse, Manila; telegraphic address, quarantine, Manila.

Stations for the inspection of arriving and departing vessels are maintained at all Philippine ports of entry. The ports of entry at present are Manila, Cebu, Davao, Iloilo, Jolo, Legaspi, and Zamboanga. Quarantine officers are continuously on duty at all of the ports named, but only at Manila, Cebu, and Iloilo are there full-time quarantine officers. At Zamboanga, Jolo, Davao, and Legaspi local physicians are employed as quarantine officers on a fee basis. At Cavite and Olongapo medical officers of the United States Navy act as quarantine officers in addition to their other duties, being detailed for this duty by the admiral commanding the Asiatic Naval Station.

## DISEASES AFFECTING THE PHILIPPINE ISLANDS

The Philippine Islands are, figuratively speaking, the hub of a half wheel, the spokes radiating to the ports of China, Japan, India, Borneo, Indo-China, the Straits Settlements, Java, and other islands of the East India Archipelago to the south. Many of the ports of these various countries are within a comparatively short steaming distance of the islands, so that the presence or absence of quarantinable diseases in the territory contiguous to the Philippine Islands is of great concern to the quarantine officer. The proximity of many of these ports, often foci of infection of epidemic diseases, constitutes a serious problem and increases the difficulty of the quarantine procedure in the Philippines. This is due to the fact that persons may leave adjacent infected ports and arrive in the Philippine Islands long before the incubation period of many of the quarantinable diseases has passed. As an instance, an individual may be exposed to smallpox in Amoy, arrive in Manila three or four days later and spend eight or ten days in the Philippines before the disease can be detected. When it is considered that the incubation period of cholera is approximately five days and that of plague seven days, and that the sailing time between the Philippines and several infected foreign ports is less than three days the difficulty of successful quarantine may be better appreciated. On account of this factor the appearance of plague, cholera, typhus fever, or other epidemic disease in any of the near-by ports is always a cause of great anxiety to the quarantine service in the Philippines. At no other place where the United States Government maintains quarantine does such a condition exist. Practically every other quarantine station under the United States jurisdiction is a considerable number of days distant from infected ports. As a result quarantine activities in the Philippines take on a more vital and important character than at those ports where the time element is a positive and continual protection and where, with the longer intermediate voyage, almost all of the quarantinable diseases develop to a point where they can be readily detected at quarantine inspection.

Sporadic cases of nearly all of the quarantinable diseases occurred in various ports of the Orient, but in only a few cases did these diseases assume epidemic proportions.

Fortunately, with the exception of Amoy, Saigon, and several Indian ports, the Orient remained comparatively free from human

plague. Smallpox occurred almost continuously, but in only a few places did it assume epidemic proportions. Cholera was quite widespread and virulent in certain districts.

## QUARANTINE AGAINST AMOY

Because of an outbreak of bubonic plague at Amoy, China, it was decided to declare a quarantine of seven days, dating from the time the vessel left Amoy, effective May 24, 1926. During the period from that date to the close of the fiscal year four vessels, carrying 204 crew and 1,014 passengers, were detained. No quarantinable diseases occurred among the persons detained.

## QUARANTINABLE DISEASES IN THE PHILIPPINE ISLANDS

The presence or absence of quarantinable disease within the Philippine Archipelago is an important factor in determining the quarantine measures to be imposed on vessels bound for American ports. On the whole, conditions in the islands with regard to quarantinable diseases have been very favorable during the past year. On June 20, 1925, one case of cholera was reported in the city of Manila. This was followed by a few sporadic cases, a total of 23 cases with 5 deaths having been reported up to the third week of September. During the week ended September 19 a considerable increase was observed, seven cases being reported. During the next 14 days 155 cases with 50 deaths occurred in the city. From that date the epidemic gradually subsided, and only a few isolated cases have been reported since November 14, 1925. A total of 313 cases with 138 deaths were reported. In the Provinces several localities reported cases of cholera, but no widespread or severe epidemic occurred during the year. The distribution was as follows:

	Cases	Deaths		Cases	Deaths
Bataan.....	20	18	Mountain Province.....	1	1
Batangas.....	16	13	Mueva Ecija.....	5	4
Bohol.....	20	15	Pampanga.....	117	102
Bulacan.....	506	298	Rizal.....	244	83
Camarines Sur.....	1	0	Romblon.....	83	68
Capiz.....	1	1	Surigao.....	1	1
Laguna.....	30	16	Zambales.....	1	1
Leyte.....	4	4			
Manila.....	313	138		1,462	839
Mindoro.....	99	76			

As soon as cholera assumed a tendency to increase this office required the examination for cholera vibrios of the stools of all persons of the steerage class leaving Manila for other American ports. The examinations made by months were as follows:

Month	Examinations made	Positive for cholera	Month	Examinations made	Positive for cholera
1925			1926		
July.....	378	0	January.....	591	5
August.....	416	7	February.....	805	8
September.....	677	9	March.....	1,028	23
October.....	874	8	April.....	1,484	12
November.....	392	4	May.....	1,288	7
December.....	392	1	June.....	1,205	5
				9,530	89

So far as known, no human plague occurred in the Philippine Islands during the year nor were any plague rats found in the course of routine examinations at the Bureau of Science.

Smallpox has become a negligible disease, temporarily at least, as a result of vaccination. Most of the Provinces of the Philippines did not report a single case of this disease during the year and only a few sporadic cases were reported from the Archipelago.

Neither typhus nor yellow fever was detected in the islands. Leprosy is present continually. The law requires the reporting and segregation of every case of leprosy detected, but no statistics are available to demonstrate whether or not the continuous segregation has actually diminished the number of new cases. To demonstrate the value of this measure would require a knowledge of all the cases which were existent when the policy of segregation was commenced, as well as the number of existing cases to-day, many of which are of an obscure nature.

#### SMALLPOX AND VACCINATION

During the latter part of the year under report smallpox occurred on several vessels bound for ports in the United States. Consequently, vaccination of all members of crews of vessels bound for American ports was required. Steerage passengers were required to present a certificate of vaccination against smallpox before purchasing tickets. Eight thousand eight hundred and thirteen seamen and 2,730 passengers were vaccinated.

Continuing the work of previous years, an endeavor was made to have all persons employed on interisland vessels vaccinated, and inspection of these vessels was instituted to check up on the results. A total of 4,641 of these persons, members of crews of interisland vessels, were vaccinated, either on board the vessels or in the quarantine office. An arrangement was made whereby no individual was permitted to sign on unless he could present a recent certificate of vaccination from the quarantine office.

#### INCOMING QUARANTINE

The chief concern of the Quarantine Service is the prevention of the introduction of quarantinable diseases by vessels. Consequently, incoming quarantine is the most important function of the service in the Philippines and one which demands most careful attention and the strictest vigilance. In addition to the routine inspection of arriving vessels, it was necessary, for a considerable period of time, to examine certain arriving passengers for cholera organisms, vaccinate crews and arriving passengers, and to detain in quarantine certain vessels arriving from infected ports. All steerage passengers for the Philippine Islands were required to undergo vaccination or to show that they had been recently successfully vaccinated before being allowed to land in the Philippines. From May 24, 1926, to the close of the fiscal year, owing to the presence of plague in Amoy, vessels from that port were required to complete seven days from the time of departure from Amoy before landing either passengers or crew in the Philippine Islands, and, in addition, to undergo fumigation prior to the discharge of any cargo. All arriving vessels were inspected to de-



termine whether or not they should be fumigated for the destruction of rodents, and the requirements prescribed were made a part of the provisional pratique which was issued on the arrival of the vessel. The amount of shipping arriving at Philippine ports compared favorably with preceding years. The figures in the statistical tables show the volume of work done.

## CONSULAR QUARANTINE

All steerage passengers leaving the Philippines for American ports were required to be vaccinated or to produce evidence of a recent successful vaccination.

Bills of health were issued at ports of entry in the Philippine Islands as follows:

Bills of health issued	To United States ports	To foreign ports	Bills of health issued	To United States ports	To foreign ports
Manila.....	449	521	Jolo.....	73	0
Cavite.....	2	11	Legaspi.....	2	1
Cebu.....	157	110	Olongapo.....	0	1
Davao.....	13	12	Zamboanga.....	112	27
Iloilo.....	141	48			

## INTERISLAND QUARANTINE

It was not necessary to impose quarantine detention on vessels engaged in plying among island ports except during a very short period in the latter part of 1925, during the cholera outbreak, when vessels from Manila were required to undergo quarantine inspection at the various island ports. Fortunately no cases of cholera are known to have been carried from Manila to other ports in the Philippine Islands by vessels. On two occasions interisland craft were reported as having cholera on board. Both of these vessels were remanded to the quarantine station at Cebu for treatment. One of these cases was bacteriologically positive and the other negative. One interisland vessel coming from the port of Romblon was quarantined at the port of Manila on arrival, owing to a sharp increase in the number of cholera cases which had occurred at Romblon, and on bacteriologic examination of stool specimens of the personnel of the vessel 11 cholera carriers were found.

Bills of health were not required for interisland vessels at any port of entry during the year. All interisland vessels were required to undergo fumigation not less than once each six months. As noted previously, the crews of interisland vessels were required to be recently vaccinated, and each new member of the crew not possessing a recent vaccination card issued by the quarantine service was revaccinated prior to being employed. Interisland vessels were permitted to enter and leave port without other restriction than filing a certificate that no cases of suspicious illness had occurred on board during the five days previous to entry. All vessels in the interisland trade were inspected at least twice during the year.

## EQUIPMENT

One of the necessities of quarantine work is water transportation. The maintenance and operation of launches and boats in the Philippine Islands always constitute a difficult problem. The rapid deterioration of wood and metal in this climate, plus the action of sea water, the continuous bad weather during a large portion of the year, resulting in accidents in boarding ships, produce a condition in connection with floating equipment which is always trying. Practically all of the funds appropriated for general repairs were expended in repairing launches. The legislature appropriated funds during the year for the purchase of another launch, and a second-hand launch in excellent condition was purchased in June, 1926, to replace the launch at Iloilo, which had to be condemned.

The buildings at the several quarantine stations were kept in fair repair. It was necessary to tear down the two-story cabin barracks at the Mariveles quarantine station because it had become unsafe. Efforts are being made to secure an appropriation to replace that building, but under present circumstances it is doubtful if funds for this purpose will be made available. The equipment of the stations is diminishing annually, since it has been impossible to replace that which has been condemned.

Two new ports of entry have been opened (Davao and Legaspi), but so far no quarantine equipment has been obtained for either of these new ports.

## AIRCRAFT

There is practically no traffic to and from the Philippine Islands by means of aircraft from foreign countries. Pratique, however, was granted to two of the airplanes which arrived in the Philippines, one from Italy and one from Spain.

*Bills rendered for quarantine services at maritime stations during the fiscal year ended June 30, 1926*

Station	Inspections of vessels	Fumiga- tions of vessels	Subsist- ence furnished to ships	Miscella- neous quarantine services	Total
Aberdeen, Wash. <sup>1</sup>	\$750.00	0	0	0	\$750.00
Atchafalaya (Morgan City), La.	0	0	0	0	0
Baltimore, Md.	7,175.00	\$31,326.56	0	\$12.00	38,513.56
Beaufort, S. C.	0	0	0	0	0
Boca Grande, Fla.	262.00	483.60	0	0	745.60
Boston, Mass.	12,047.00	15,828.97	0	0	27,875.97
Brunswick, Ga.	215.00	122.73	0	0	337.73
Cape Fear (Southport), N. C.	442.00	1,002.80	0	0	1,444.80
Cedar Keys, Fla.	0	0	0	0	0
Charleston, S. C.	1,657.00	1,523.62	0	0	3,180.62
Columbia River (Astoria), Oreg.	1,310.00	6,162.79	0	0	7,472.79
Coos Bay, Oreg.	180.00	170.00	0	0	350.00
Cumberland Sound (Fernandina), Fla.	80.00	59.43	0	0	139.43
Delaware Breakwater, Del.	52.50	0	0	0	52.50
Eastport, Me.	0	0	0	0	0
Eureka, Calif.	105.00	116.20	0	0	221.20
Fall River, Mass.	485.00	0	0	0	485.00
Fort Bragg, N. C.	0	0	0	0	0
Fort Monroe, Va.	7,453.00	18,577.75	0	153.00	26,183.75
Freeport, Tex.	1,060.00	0	0	0	1,060.00
Galveston, Tex.	6,396.00	7,811.62	0	0	14,207.62
Georgetown, S. C.	20.00	0	0	0	20.00
Gloucester, Mass.	0	0	0	0	0
Gulf, Miss.	540.00	1,222.77	0	10.00	1,772.77

<sup>1</sup> Formerly Hoquiam, Wash.

*Bills rendered for quarantine services at maritime stations, etc.—Continued*

Station	Inspections of vessels	Fumiga- tions of vessels	Subsist- ence furnished to ships	Miscella- neous quarantine services	Total
Hawaii.....	9,273.00	520.54	\$724.00	61.75	10,579.29
Jacksonville, Fla. <sup>2</sup> .....	1,390.00	1,430.62	0	0	2,820.62
Ketchikan, Alaska.....	0	0	0	0	0
Key West, Fla.....	3,603.00	69.24	0	0	3,672.24
Marcus Hook (Philadelphia), Pa.....	11,120.00	35,895.77	0	.25	47,016.02
Miami, Fla. <sup>3</sup> .....	2,998.00	0	0	0	2,998.00
Mobile, Ala.....	3,779.00	7,140.87	0	0	10,919.87
Monterey, Calif.....	0	0	0	0	0
New Bedford, Mass.....	170.00	0	0	434.00	604.00
New Orleans, La.....	27,663.00	14,629.90	147.00	957.02	43,396.92
Newport, Oreg.....	0	0	0	0	0
Newport, R. I.....	10.00	0	0	0	10.00
New York, N. Y.....	42,665.00	167,069.93	71.13	24,136.50	233,942.56
Ogdensburg, N. Y.....	0	0	0	0	0
Pascagoula, Miss.....	200.00	45.00	0	0	245.00
Pensacola, Fla.....	994.00	3,090.08	8.00	0	4,092.08
Perth Amboy, N. J.....	370.00	901.84	0	0	1,271.84
Port Angeles, Wash.....	0	0	0	0	0
Port San Luis, Calif.....	90.00	0	0	0	90.00
Porto Rico.....	7,020.50	808.98	0	512.00	8,341.48
Portland, Me.....	1,655.00	3,284.67	0	0	4,939.67
Port Townsend, Wash.....	4,841.00	2,308.85	69.00	0	7,218.85
Providence, R. I.....	1,235.00	38.72	0	0	1,273.72
Sabine, Tex.....	3,306.00	4,716.93	0	19.50	8,042.43
St. Andrews, Fla.....	100.00	193.07	0	0	293.07
St. George Sound, Fla.....	0	0	0	0	0
St. Joseph, Fla.....	0	0	0	0	0
San Diego (Point Loma), Calif.....	2,401.00	106.46	0	6.25	2,513.71
San Francisco, Calif.....	6,196.00	42,984.69	188.00	0	49,368.69
San Pedro, Calif.....	9,573.00	12,802.54	0	2.00	22,377.54
Santa Barbara, Calif.....	0	0	0	0	0
Savannah, Ga.....	1,560.00	1,153.87	0	0	2,713.87
Seattle, Wash.....	0	11,802.52	0	0	11,802.52
South Bend, Wash.....	90.00	9.00	0	0	99.00
Tampa, Fla.....	2,430.00	3,218.68	0	0	5,648.68
Vineyard Haven, Mass.....	12.00	0	0	0	12.00
Virgin Islands.....	3,058.26	61.96	0	7.00	3,127.22
Washington, N. C.....	0	0	0	0	0
West Palm Beach, Fla. <sup>4</sup> .....	0	0	0	0	0
Total.....	188,032.26	398,693.57	1,207.13	26,311.27	614,244.23

<sup>2</sup> Formerly St. Johns River, Fla.<sup>3</sup> Formerly Biscayne Bay, Fla.<sup>4</sup> Opened Apr. 1, 1926.

## TRANSACTIONS AT FOREIGN PORTS

*Summary of transactions at foreign ports*

Stations	Vessels inspected	Vessels fumigated	Passengers and crews inspected	Bills of health counter- signed
Amoy, China.....	27	0	15,918	43
Guantanamo Bay, Cuba.....	6	0	0	265
Guayaquil, Ecuador.....	151	0	13,662	201
Habana, Cuba.....	2,126	240	259,252	2,126
Hongkong, China.....	378	33	98,775	488
Progreso, Mexico.....	259	14	13,261	259
Puerto Mexico, Mexico.....	0	1	0	60
Shanghai, China.....	387	136	25,357	651
Tampico, Mexico.....	1,646	445	11,473	1,646
Tuxpam and Port Lobos, Mexico.....	12	0	570	12
Vera Cruz, Mexico.....	348	125	19,171	348
Yokohama, Japan.....	300	51	61,358	745
Total.....	5,640	1,045	518,797	6,844
European ports.....	1,134	802	336,264	5,962
Total.....	6,774	1,847	855,061	12,806

## REPORTS FROM FOREIGN PORTS

## SERVICE OPERATIONS IN EUROPE

*Paris, France.*—Surg. W. W. King in charge.

The quarantine operations of the service in Europe have continued along the same lines as in previous years, attention being paid chiefly to the inspection of third-class passengers and those of the same type traveling second class. The sanitary standard of this type of passenger has materially improved during the past few years, largely as a result of the enforcement of sanitary measures by Public Health Service officers at foreign ports.

The institution of medical examination prior to granting consular visas to persons going to the United States has caused a still further improvement in passengers coming from countries where such examinations have been made.

The higher standard of personal hygiene of the passenger, with the continued improvement of health conditions in Europe, have permitted some modification of the measures applied at European ports to passengers embarking for the United States. It has been possible to make these measures less rigorous in regard to vaccination against smallpox, delousing of persons, and disinfection of baggage. The routine application of sanitary measures to persons of steerage type from certain countries has been discontinued, but it is still in force in regard to persons of this type from certain other countries whose health conditions, although improved, do not yet warrant the discontinuance of general application of the sanitary measures. Vaccination is still required for persons coming from districts where smallpox prevails in epidemic form, and persons from countries where typhus fever prevails must undergo the measures directed against vermin infestation. Passengers of the third-class type from all Europe are inspected and are subjected to sanitary measures if the inspection shows that such measures are required.

The modifications in the sanitary regulations were made during the last quarter of the fiscal year and had proportionately small effect upon the statistics for the whole year, which show approximately the same numbers as those of the previous year. The Public Health Service officer detailed at Belfast, Ireland, primarily for the medical examination of persons applying for consular visas, has also exercised supervision of the application of the quarantine measures to vessels and persons leaving that port for the United States, and Belfast appears for the first time on the statistical table. On the other hand, the supervision of such measures by Public Health Service officers has ceased at the following ports: Marseille, France, October 17, 1925; and Havre, France, April 30, 1926.

## SANITARY CONDITIONS IN EUROPE

General health conditions in Europe and those portions of Asia and Africa from which travel to the United States comes via Euro-



pean ports has maintained the reasonably good state of the previous years.

Plague continues to be endemic in the Canary and the Madeira Islands and in Egypt. Occasional cases have been reported from Constantinople, Beirut, and other Mediterranean ports. More important outbreaks have occurred at Athens and Piræus, with sporadic cases occurring in other parts of Greece; at Kairwan, Tunisia, and in the extreme southeastern districts of European Russia.

Typhus fever continues prevalent in Russia and Poland, but less than in previous years. Lithuania, Rumania, Yugoslavia, and Czechoslovakia constantly report the presence of this disease in widely scattered localities, except the latter, where the disease seems to be confined to the extreme eastern part of the country. Morocco, Tunisia, and Egypt have reported outbreaks, and occasional cases are reported from Algeria. A small outbreak at Naples, Italy, during February and March was promptly controlled.

Smallpox has been specially prevalent in England, where the number of cases has reached epidemic proportions at times in some districts, although the type of the disease is very mild. In Spain the malignant type of the disease continues. Epidemics have occurred in Algeria, Tunisia, and Egypt. An outbreak at Paris, France, occurred during the winter. Russia and Poland have reported an unusually low incidence of the disease.

#### MISCELLANEOUS OPERATIONS

The service officers in Europe supervise the fumigation for deratization of vessels bound to the United States when the quarantine regulations require that measure. Other operations have included the collection and transmission of sanitary information, medical examination, and treatment of American seamen, beneficiaries of the Veterans' Bureau, etc., and valuable service has been rendered by advice given consular officers upon medical questions which frequently arise in the course of official matters.

#### INTERNATIONAL MEDICAL CONFERENCE

Surg. W. W. King was detailed as the delegate of the Public Health Service at the International Malaria Congress held at Rome, Italy, October 3-5, 1925; as delegate of the United States on the Permanent Committee of the International Office of Public Hygiene, which met at Paris, France, October 19-29, 1925, and May 3-13, 1926; and as one of the delegates of the United States at the International Sanitary Conference held at Paris, France, May 10-June 21.

Surgeon Hooper was detailed to represent the Public Health Service at the Fourth International Conference on Industrial Accidents and Diseases held at Amsterdam, the Netherlands, September 5-12, 1925.

*Report of service operations in Europe, fiscal year 1926*

Place	Baggage disin- fected	Baggage inspected without disin- fection	Vessels inspected	Vessels fumi- gated	Bills of health counter- signed	Medical examina- tions of service benefi- ciaries
Antwerp, Belgium	1,833	5,194		96	870	
Barcelona, Spain	215	19	94	24	91	
Belfast, Ireland	9	10			58	23
Bordeaux, France				5		
Bremen, Germany	6,004	10,066		74	331	1
Cherbourg, France	16,008	1,755			356	
Cobb, Irish Free State	11,130	9,282		1	193	
Danzig, Free City	20,471	856	174	2	28	
Genoa, Italy	5,495	1,062	88	101	285	163
Glasgow, Scotland		29	39	39	259	
Hamburg, Germany	6,567	67,282	346	227	682	1
Havre, France	3,469	7,243	45	63	221	40
Libau, Latvia	4,095	1,193	47			
Liverpool, England	196			43	410	
London, England		1,745	1	55	564	25
Londonderry, North Ireland	13	389			27	
Marseille, France	36	85	7	2	53	3
Naples, Italy	27,286	26,617	167	8	269	194
Patras, Greece	1,111	340	31		31	13
Piræus, Greece	3,109	994	69		84	35
Rotterdam, Holland	3,517	3,787		60	712	1
Southampton, England	1,156		26	2	438	
Total	111,720	137,948	1,134	802	5,962	499

Place	Pas- sengers in- spected	Crew in- spected	Pas- sengers vacci- nated	Crew vacci- nated	Pas- sengers de- loused	Crew de- loused	Pas- sengers de- tained	Pas- sengers re- jected
Antwerp, Belgium	6,425		4,666		1,406		1,228	
Barcelona, Spain <sup>1</sup>	304		48					
Belfast, Ireland <sup>2</sup>	202	329	9		13			
Bremen, Germany	39,814		15,879		6,130		3,909	68
Cherbourg, France	47,517		20,811		16,244		9,028	
Cobb, Irish Free State	26,755	3	17,210		17,102	1		1
Danzig, Free City	22,188		10,932		20,483			
Genoa, Italy	9,656		6,105		5,487			
Glasgow, Scotland	16,623	755	9,183		66			
Hamburg, Germany	37,861		13,804		3,234		1,648	
Havre, France <sup>3</sup>	15,800		4,509		2,416		1,920	
Libau, Latvia	5,349	52	2,206	48	2,661	57		
Liverpool, England	14,838		2,104		1,015		13	22
London, England	2,401		254					
Londonderry, North Ireland	2,595		1,039		418			
Marseilles, France <sup>4</sup>	68		66		10			
Naples, Italy	32,330	9,604	32,330	157	22,823			
Patras, Greece	960	3,975	960	28	674	83		9
Piræus, Greece	3,932	4,891	3,839	895	3,589		67	
Rotterdam, Holland	7,810		3,062		2,405		1,237	4
Southampton, England	23,227		12,263		848		35	48
Total	316,655	19,609	159,279	1,128	107,024	141	19,088	152

<sup>1</sup> Operations ceased Dec. 31, 1925.<sup>2</sup> Operations began Aug. 1, 1925.<sup>3</sup> Operations ceased Apr. 30, 1926.<sup>4</sup> Operations ceased Oct. 17, 1925.

NOTE.—Reasons for rejection: Vermin infested, 75; fever, 9; measles, 1; to complete observation period after delousing, 32; other members of families of detained persons, 5; immigrants booked as special third-class tourists, 8.

## AMOY, CHINA

Acting Asst. Surg. E. J. Strick in charge.

All passengers for the Philippines were vaccinated against small-pox. At first this vaccination was done at the time of sailing, but at the beginning of 1925, with the advice and cooperation of the chief

quarantine officer, a new system was instituted. The steamship companies supply the prospective passengers with cards to which the passenger's photograph is attached. The passenger comes back for daily inspection until his immunity is established and he is then released. The steamship companies are warned not to allow any passengers on board unless they have been released.

#### GUAYAQUIL, ECUADOR

Acting Asst. Surg. Carlos V. Coello in charge.

*Plague.*—One hundred and twenty-four cases of plague, with 54 deaths, occurred in Guayaquil and vicinity during the calendar year 1925. This is 30 cases and 11 deaths more than during the previous year, although the measures carried out by the local health authorities have been enforced with the usual activity. Deratization has been active. According to official information, 269,190 rats were trapped during 1925, 1,165 of which were found to be infected with plague.

Plague appeared this year in Ambato, 318 kilometers from Guayaquil and 2,608 meters above sea level, where 40 cases were reported, causing considerable concern in that region, especially Quito (146 kilometers north of Ambato). After a few weeks of intensive work (vaccination, isolation, and deratization) the disease apparently disappeared. This is not the first time that Ambato has been visited by the plague; in 1915, 11 cases and in 1921, 7 cases were reported.

*Smallpox.*—Only 1 case was reported, with no death, against 6 cases reported during the previous year. During the same time 5,959 persons were vaccinated by the local public-health service. Passengers booked from this port for the Canal Zone or ports of the United States, as well as those in transit from Peru and Chile, were required to show evidence of recent vaccination for smallpox. Intense vaccination is responsible in part, at least, for the abatement of this disease.

#### HABANA, CUBA

Acting Asst. Surg. Richard Wilson in charge.

The transactions at Habana are shown in the following table:

	1924-25	1925-26	Increase or decrease
Vessels going direct.....	1,129	1,171	42
Vessels going via foreign ports.....	943	955	12
Total bills of health issued.....	2,072	2,126	54
Members of crews on vessels going direct.....	83,321	93,936	10,615
Members of crews on vessels going via foreign ports.....	54,420	55,403	983
Total members of crews.....	137,741	149,339	11,598
Passengers embarking in Habana.....	48,199	60,508	12,309
Passengers in transit.....	44,932	49,405	4,473
Total passengers.....	93,131	109,913	16,782
Passengers for the United States and its dependencies (included in the above).....	75,107	91,403	16,296
Vaccination certificates.....	0	0	0
Vessels fumigated by the service.....	11	12	1
Vessels fumigated by the Cuban quarantine under the supervision of the service.....	124	228	104
Vessels recommended for fumigation at a United States port.....	0	0	0

## HONGKONG, CHINA

Asst. Surg. F. J. Halpin in charge.

On July 17, 1925, smallpox was discovered in a second-class passenger on the steamship *Empress of Russia* on arrival at this port from Shanghai en route to Manila. The sick person, with two other occupants of the same cabin, were removed from the ship and placed in quarantine. All passengers and crew were vaccinated by the ship's surgeon. The second-class cabins were fumigated by the colonial port medical authorities. At the time of inspection and sailing for Manila, P. I., July 18, at 5 p. m., there was no evidence of sickness on board.

On March 15, 1926, a Filipino male steerage passenger from Manila en route to Seattle was removed from the steamship *President Grant* on arrival at this port upon cabled advice from the director, quarantine district of the Orient, that he was a cholera carrier. This passenger was transferred to the steamship *President Monroe* and returned the following day to Manila. He was placed in isolation in the ship's hospital.

Twenty prospective Chinese passengers holding overdue laborer's return certificates issued by the Bureau of Immigration of the United States or of the Philippine Islands were sent to this office by the American consul general in order to ascertain, if possible, if their contention that they were unable to return to the United States or the Philippine Islands because of physical disabilities was justified.

Effective June 5, 1925, a new system of vaccination for the prevention of smallpox among steerage passengers for the Philippine Islands was instituted. The system consists of the scratch method with single-scratch control. Steamship companies are advised not to sell tickets to prospective steerage passengers until the latter are passed by this office. The steamship company supplies a card upon which appears the name, address of last permanent residence, and photograph of the prospective passenger. The applicant is instructed to bring the card to a local physician on the approved list, who after vaccinating applicant affixes his name and the date. After 24 hours and each succeeding day the passenger reports to this office for observation until a "take" or "immunity reaction" is established. The card is then signed by the medical officer and impressed with the service seal. Upon presentation of this card at the steamship office the passenger is eligible to travel. The same procedure was inaugurated with reference to steerage passengers destined for the United States, effective April 1, 1926.

## YOKOHAMA, JAPAN

Surg. V. B. Murray in charge.

Yokohama may now be considered as having recovered from the effects of the earthquake and fire, especially in respect of dock construction and other public work.

Although exposed to at least two formidable invasions of quarantinable diseases, the prefectural sanitary authorities, coordinated by the sanitary bureau of the home department, have at all times kept the situation well under control.



Cholera was present in the Tokyo Bay and Inland Sea region from late in August until the end of October, 1925. It appears that this infection was spread from shell-fishing grounds, which had been contaminated by shipping from south China. Special regulations against smallpox were put into effect in Yokohama February 22, 1926, and removed May 21, 1926. A total of 68 cases were reported from the Prefecture in which Kokohama is situated.

Preceding the epidemic persons infected with smallpox had been landed from vessels from the United States, Canada, and China, although it is probable that the infection was introduced from China. The strict enforcement of vaccination by the Japanese Government as a prerequisite to entering school and the revaccination of men when they are called up for military examination kept the number of cases down.

October 31, 1925, the Far Eastern Association of Tropical Medicine met in Tokyo. This was the first international congress to be held in Japan. Surg. H. F. Smith and Vance B. Murray represented the Public Health Service at this meeting.

Annual medical examinations of the naval officers attached to the American Embassy in Tokyo were made on March 23, 1926.

Kedani mites and snails were collected and forwarded to the hygienic laboratory. Sera from patients infected with Ohara's disease were forwarded to Surg. Edward Francis, who identified this disease as tularemia. Arrangements were made for the shipment of cultures of plague bacilli from Doctor Wu, of Harbin, to Surg. N. E. Wayson at San Francisco.

A special report on the occurrence of plague in Japan was prepared and forwarded to the bureau.

### SUMMARY OF QUARANTINE TRANSACTIONS

*Summary of quarantine transactions at continental, insular, and foreign stations for the fiscal year ended June 30, 1926*

Station	Number of vessels inspected	Number of vessels fumigated	Number of passengers and crews inspected	Bills of health issued or counter-signed
Continental.....	17, 056	5, 019	11, 777, 064	0
Insular.....	2, 868	696	378, 414	2, 980
Foreign.....	6, 774	1, 847	855, 061	12, 806
Total.....	26, 698	7, 562	3, 010, 539	15, 786

<sup>1</sup> Maritime stations, 1,709,855; border stations, 67,209. Statistics do not include "local" travelers at border stations, numbering 5,318,846, who, however, were given cursory inspection.

### MEDICAL INSPECTION OF ALIENS

During the fiscal year there were examined by medical officers of the United States Public Health Service 614,972 alien passengers for the purpose of detecting physical or mental defects or diseases, as provided for in the United States immigration laws, as compared with 545,472 for the fiscal year ended June 30, 1925, 938,928 for the fiscal year ended June 30, 1924, 745,515 for the fiscal year ended

June 30, 1923, 586,228 for the fiscal year ended June 30, 1922, and 1,137,682 for the fiscal year ended June 30, 1921. In addition to the passengers examined, 872,842 alien seamen were inspected, as provided for in the act of February 5, 1917, as compared with 854,915 for the fiscal year ended June 30, 1925, 874,962 for the fiscal year ended June 30, 1924, 826,295 for the fiscal year ended June 30, 1923, 783,193 for the fiscal year ended June 30, 1922, and 851,928 for the fiscal year ended June 30, 1921. The reduction in the number of alien passengers examined in 1922 and subsequent years from that in 1921 was largely due to the application of the "3 per cent law." The immigration act of 1924 further reduced the number of immigrants. The accompanying tables present in detail the data relative to the inspection and certification of alien passengers and alien seamen.

#### EXAMINATION OF PROSPECTIVE IMMIGRANTS ABROAD

A change in the method of handling prospective immigrants to the United States, of far-reaching importance, was inaugurated during the fiscal year. For many years the hardships necessarily entailed upon a certain number of would-be immigrants by their rejection at the ports of entry to the United States have elicited the sympathies of philanthropically inclined persons. More recently a steadily growing popular demand that measures be taken to mitigate or avoid the imposition of such hardships has become manifest. The passage of the immigration act of 1924, by authorizing American consular officers to withhold visas from persons ineligible to enter the United States, made it possible to comply with the growing demand for the examination of prospective immigrants in the countries of their origin previous to embarkation for the United States.

About the beginning of the fiscal year it was decided by mutual agreement of the Secretaries of the State, Treasury, and Labor Departments with the British Government to conduct, for a period of three months, an experiment to determine the feasibility of examining prospective immigrants in the country of origin. It was planned that medical officers of the Public Health Service and inspectors of the Bureau of Immigration would act as technical advisors in their respective lines to the consular officers who issue the immigration visas.

In accordance with the plan, on August 1, 1925, medical officers were detailed for duty at the American consulates at Belfast, Cobh, Dublin, Glasgow, Liverpool, London, and Southampton.

The advantages to the three classes of people directly concerned of having the prospective immigrants examined before embarkation are so obvious that the success of this experiment was practically assured before it was begun. The parties directly interested in the examination of immigrants are: (1) The people of the United States, (2) the immigrants, (3) the transportation companies.

The advantages to the people of the United States are: The immigration laws are much more efficiently enforced when the prospective immigrants are examined by medical officers of the Public Health Service abroad. Up to date, all of the immigrants found to be afflicted with diseases mandatorily excludable under the law were refused visas by the consular officers. It is a matter of common

knowledge that only a part of the immigrants certified for mandatorily excludable diseases in ports of the United States are actually deported. Lack of funds, political influence, and a host of other factors operate to make deportation difficult or impossible. Also a considerable proportion of the aliens certified as afflicted with disease or disability liable to affect their ability to earn a living were refused visas. The fact that the examinations of prospective immigrants abroad are made according to schedule and by appointment makes it possible for them to be more thorough and painstaking as compared with the necessarily hurried examinations when large ship-loads of immigrants arrive at United States ports.

The advantage to the immigrant of being examined near his home and of being reasonably certain that he will not be denied admission to the United States before he has disposed of his goods and chattels and undertaken a tiresome and expensive journey is very great. It is obvious that the financial losses and heartaches necessarily entailed by rejection at the port of entry are greatly mitigated by rejection before departure.

The substitution of refusing visas for rejection at the port of arrival is bound to reduce materially the number of fines imposed upon transportation companies for importation of aliens in violation of law.

Transportation companies, the immigrants, officials of the State, Treasury, and Labor Departments, and the press, both foreign and domestic, are practically unanimous in approval of the plan.

Because of the success of the experiment in Great Britain and Ireland, the examination of prospective immigrants has been extended to Antwerp, Belgium, and Rotterdam, the Netherlands, and it is expected that it will be introduced at Berlin, Bremen, Cologne, Hamburg, and Stuttgart, Germany; Copenhagen, Denmark; Bergen and Oslo, Norway; Warsaw, Poland; and Gothenburg and Stockholm, Sweden, early in the next fiscal year.





Gloucester, Mass.	0					0													
Halifax, N. S.	4,370	9		161	143	313			3	3		3							
Havre, Mont.	33			2	2	4													
Hidalgo, Tex.	30,138		21	4		25						19					2		
Honolulu, Hawaii <sup>2</sup>	1,265		19	11	4	34											1		17
Houlton, Me.	27	2		1		3					2								
International Falls, Minn.	769	7		40	1	43				4		3							
Jackman, Me.	31	3	1	1	6	11	1		2								1		
Jacksonville, Fla. <sup>3</sup>	12					0													
Ketchikan, Alaska	0					0													
Key West, Fla.	8,344	3		3		6	1					2							
Laredo, Tex. <sup>4</sup>	28,189	20	219	373	28	640	13	1	1	1		4	101		3	7	75		
Lewiston, N. Y.	0					0													
Marcus, Wash.	413	3		18	20	41				3									
Miami, Fla. <sup>5</sup>	1,458					0													
Mobile, Ala.	141					0													
Montreal, Canada	22,721	101	143	1,254	108	1,606	47	2	9			43	71	4		28	39		
Naco, Ariz.	3,619	31	84	27	4	146		2	4	15	10	12			32		40		
New Bedford, Mass.	197		1		2	3									1				
New Orleans, La. (city)	339	1				1			1										
New Orleans, La. (quarantine)	4,083					0													
Newport, Vt.	3,953	24	2	105	40	171	15		3	1	1	3	1				1		
New York, N. Y.	271,371	81	173	7,140	5,157	12,551	22	3	19			37	69	5	12	11	74		
Niagara Falls, N. Y.	4,229	12		75	64	151	3	1	4			1							
Nogales, Ariz.	11,194		20	81	5	109	1	1				16			1		1		
Noyes, Minn.	303	7	8	15	11	41	4			1		2			2		6		
Ogdensburg, N. Y.	65	8	1	11	11	31	2			2		4			1				
Oroville, Wash.	183				2	2													
Pascagoula, Miss.	0					0													
Pensacola, Fla.	10			1		1													
Perth Amboy, N. J.	2					0													
Philadelphia, Pa.	532				27	27													
Philippine Islands <sup>6</sup>	11,515	1	48	30		79						3					1		
Portal, N. Dak.	581	10	3	110	8	131		6	1			3					1		
Port Angeles, Wash.	0					0													
Port Huron, Mich.	2,782	54	3	199	70	326	14	3	4	23	2	8		1	1		1		
Portland, Me.	130				5	5													
Portland, Oreg.	11	2	3	4		9	1					1			1		2		
Porto Rico (other than San Juan)	1,065					0													
Port San Luis, Calif.	5					0													
Port Townsend, Wash.	2,119		1			1									1				
Presidio, Tex.	12,692					0													
Providence, R. I.	3,144		4	50	5	59							3						
Quebec, Canada	8,387	2	1	113	46	162	2						1						
Rio Grande, Tex.	260	1	6	4		11			1			6							
Rouses Point, N. Y.	593	9	4	34	3	50	2	1	1		1	4					4		
Sabine, Tex.	25					0													

<sup>1</sup> Formerly Hoquiam, Wash.<sup>2</sup> 1 case leprosy, Honolulu, Hawaii.<sup>3</sup> Formerly St. Johns River, Fla.<sup>4</sup> 1 case leprosy, Laredo, Tex.<sup>5</sup> Formerly Biscayne Bay, Fla.<sup>6</sup> 1 case leprosy, Philippine Islands.



West Palm Beach, Fla. <sup>8</sup> -----	0	-----	-----	-----	-----	0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wilmington, N. C.-----	7	-----	-----	-----	-----	0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Winnipeg, Canada-----	17,762	29	3	1,040	136	1,208	6	3	2	1	-----	17	1	-----	-----	2	-----
Yarmouth, Nova Scotia-----	24,153	7	-----	140	119	266	3	1	1	1	-----	1	-----	-----	-----	-----	-----
Total-----	614,972	731	1,216	14,014	7,915	23,876	212	48	86	138	36	195	498	39	147	58	364 110

<sup>7</sup> Formerly San Fernando, Ariz.

<sup>8</sup> West Palm Beach, Fla., established Apr. 1, 1926.

*Alien seamen inspected and certified at all ports in the United States and Canada*

Place	Number of alien seamen examined	Alien seamen certified				Total	Important diseases for which certification was made											
		Class A		Class B	Class C		Idiocy, imbecility, feeble-minded, mentally defective	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Clonorchiasis
		(1) Idiocy, imbecility, feeble-minded, insanity, mentally defective, epilepsy, tuberculosis, chronic alcoholism	(2) Loathsome contagious or dangerous contagious diseases	Disease or defect which affects ability to earn a living	Disease or defect of less degree													
Astoria, Oreg.	4,300		8	1	9									1	3	4		
Aberdeen, Wash.	3,160		1		1													
Ajo, Ariz.	0				0													
Baltimore, Md.	18,451	3	80	23	113	1					2			24	15	41		
Bellingham, Wash.	29				0													
Blaine, Wash.	0				0													
Boston, Mass.	61,858	2	208	207	520				1		1	53		37	70	48		
Brownsville, Tex.	0				0													
Brunswick, Ga.	177			2	2						1					1		
Buffalo, N. Y.	1,744	2	1	19	22			1			1			1				
Calais, Me.	0				0													
Callexico, Calif.	0				0													
Charleston, S. C.	3,053		5	7	12									1	1	3		
Columbus, N. Mex.	0				0													
Coos Bay, Oreg.	645				0													
Delaware Breakwater, Del.	97				0													
Del Rio, Tex.	0				0													
Detroit, Mich.	0				0													
Douglas, Ariz.	0				0													
Duluth, Minn.	727		1	1	3											1		
Eagle Pass, Tex.	0				0													
Eastport, Idaho.	0				0													
Eastport, Me.	0				0													
El Paso, Tex.	0				0													
Fall River, Mass.	693				0													
Fernandina, Fla.	278				0													
Fort Monroe, Va.	27,555	12	149	9	202	12						1		12	70	66		
Freeport, Tex.	1,567		3		3									1		2		



Galveston, Tex.	14,903	12	85	35	2	134					5		23	5	52
Gloucester, Mass.	180		2	1		3							1	1	
Halifax, Nova Scotia.	0					0									
Havre, Mont.	0					0									
Hidalgo, Tex.	0					0									
Honolulu, Hawaii	2		1			1						1			
Houlton, Me.	0					0									
International Falls, Minn.	0					0									
Jackman, Me.	0					0									
Jacksonville, Fla. <sup>2</sup>	2,475		5			5							4	1	
Ketchikan, Alaska	2					0									
Key West, Fla.	4,204		1			1									1
Laredo, Tex.	0					0									
Lewiston, N. Y.	0					0									
Marcus, Wash.	0					0									
Miami, Fla. <sup>3</sup>	6,213		4			4									4
Mobile, Ala.	7,706		26	9		35						10	2	14	
Montreal, Canada	0					0									
Naco, Ariz.	0					0									
New Bedford, Mass.	301			1		1									
New Orleans, La. (city)	3,266	3	24		6	33		2		1			2	3	14
New Orleans, La. (quarantine)	52,555					0									
Newport, Vt.	0					0									
New York, N. Y. <sup>4</sup>	474,285	19	348	59	10	436	1	7		11	53		52	85	156
Niagara Falls, N. Y.	0					0									
Nogales, Ariz.	0					0									
Noyes, Minn.	0					0									
Ogdensburg, N. Y.	696		2	7	6	15									2
Oroville, Wash.	0					0									
Pascagoula, Miss.	115		3	1		4								1	2
Pensacola, Fla.	2,820		12	2	32	46					1		3	6	2
Perth Amboy, N. Y.	73		2			2							2		
Philadelphia, Pa.	29,621	9	147	63	20	239	1	5		3	2		69	3	73
Philippine Islands	0					0									
Portal, N. Dak.	0					0									
Port Angeles, Wash.	54					0									
Port Huron, Mich.	0					0									
Portland, Me.	5,981		6		3	9								1	5
Portland, Oreg.	4	1	3			4				1				3	
Porto Rico (other than San Juan)	10,632		21			21							1	14	6
Port San Luis, Calif.	273				3	3									
Port Townsend, Wash.	20,735	2	15	1	1	19	1	1						7	8
Presidio, Tex.	0					0									
Providence, R. I.	4,151		2			2							1		1
Quebec, Canada	5		1			1									
Rio Grande, Tex.	0					0									
Rouses Point, N. Y.	0					0									
Sabine, Tex.	8,984	4	20			24	1	1		2	4		4	3	8
St. Albans, Vt.	0					0									
St. John, New Brunswick	0					0									
San Diego, Calif.	4,739					0									
San Francisco, Calif.	34,972		4			4							1	2	1

<sup>1</sup> Formerly Hoquiam, Wash.

<sup>2</sup> Formerly St. Johns River, Fla.

<sup>3</sup> Formerly Biscayne Bay, Fla.

<sup>4</sup> 1 case leprosy, New York, N. Y.

*Alien seamen inspected and certified at all ports in the United States and Canada—Continued*

Place	Number of alien seamen examined	Alien seamen certified					Important diseases for which certification was made											
		Class A		Class B	Class C	Total	Idiocy, imbecility, feeble-minded, mentally defective	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Clonorchiasis
		(1) Idiocy, imbecility, feeble-minded, insanity, mentally defective, epilepsy, tuberculosis, chronic alcoholism	(2) Loathsome contagious or dangerous contagious diseases	Disease or defect which aff ability to earn a living	Disease or defect of less degree													
San Juan, P. R.	9,846		16	6	1	23												
San Pedro, Calif.	35,348	1	15	3	2	21					1	8			3	9	6	
Sasabe, Ariz. <sup>5</sup>	0					0												
Sault Ste. Marie, Mich.	0					0												
Savannah, Ga.	4,279		28	10		38					1				2	14	12	
Scobey, Mont.	0					0												
Seattle, Wash.	0					0												
Sumas, Wash.	0					0												
Sweetgrass, Mont.	0					0												
Tacoma, Wash.	698			1		1												
Tampa, Fla.	0					0												
Tampa Bay, Fla. (quarantine)	3,949		16			16						2			3	7	4	
Tia Juana, Calif.	0					0												
Tucson, Ariz.	0					0												
Van Buren, Me.	0					0												
Vanceboro, Me.	0					0												
Vancouver, B. C.	0					0												
Victoria, B. C.	3,450					0												
Vineyard Haven	23					0												
West Palm Beach, Fla.	0					0												
Wilmington, N. C.	961		4			4										4		
Winnipeg, Canada	0					0												
Yarmouth, Nova Scotia.	2					0												
Total	872,842	70	1,269	468	231	2,038	15	4	15	1	0	25	129	0	255	336	540	0

<sup>5</sup> Formerly San Fernando, Ariz.

## REPORTS FROM IMMIGRATION STATIONS

## BOSTON, MASS.

Acting Asst. Surg. A. J. Nute in charge.

One thousand two hundred and eight vessels from foreign ports were boarded for medical inspection of arriving aliens.

The character of alien passenger travel to Boston with respect to classification on manifests and number of certificates issued is indicated by the following table:

Class	Number aliens	Class A	Class B	Class C	Total	Per cent certified
1.....	1,107	0	35	16	51	4.5
2.....	3,622	21	286	316	623	17.0
3.....	6,618	4	300	584	888	13.4
Stowaways.....	46	4	2	2	8	17.4
Total.....	11,393	29	623	918	1,570	13.7

The medical inspection of prospective immigrants abroad by service officers has already shown certain results. It will take years to determine its true value, but a general improvement in the physical and mental types of aliens arriving from Great Britain and Ireland, particularly in regard to class A conditions, is already noticeable.

Massachusetts institutions reported no public charges due to physical or mental defects among aliens medically passed at Boston during the period July 1, 1925, to June 30, 1926. One hundred and seventeen aliens were admitted to appropriate hospitals during the year. Among these were two unusual types of purpura following severe seasickness. No epidemic diseases occurred in the detention quarters, an unusual event in the history of this station. The inmates consisted mainly of Chinese aliens awaiting disposition, stowaways, and persons charged with being illegally in the United States, a total rarely exceeding 50. Arriving aliens detained, exclusive of hospital cases, have been almost negligible.

## EL PASO, TEX.

Surg. J. G. Wilson in charge.

The work of the medical examination of aliens during the past year has been of the same character as usual, immigration at this port being mostly Mexican.

The laboratory service installed in the fall of 1924 is a great aid in the diagnosis of tuberculosis, syphilis, gonorrhea, favus, and ringworm. The following examinations were made:

Wassermann.....	107
Gonococcus.....	66
Nail scrapings.....	48

The detention barracks at the immigration station are given general hygienic supervision and aliens detained therein receive medical attention.

## NEW YORK, N. Y.

Senior Surg. E. K. Sprague in charge.

Due to the inauguration of the examination of prospective immigrants to the United States at the ports of departure in Great Britain and other European countries, the medical personnel at Ellis Island has been in a continual state of transition. Since it seems advisable that the medical officers detailed for this duty should have had experience that can be obtained at Ellis Island only, several highly efficient officers were lost to this station.

The total number of aliens arriving at the port of New York was 271,371, an increase of 30,131 over the previous year. These aliens were classified as 53,854 first, 93,999 second, and 123,518 third class.

All of the first and second class passengers were examined aboard ship in accordance with the usual practice at the port of New York. Of the third-class passengers 72,665 were examined intensively at Ellis Island. The remaining 50,953 were examined on shipboard either because they had been examined by medical officers of the Public Health Service at foreign ports of embarkation or because they held return permits issued by the Immigration Service. This change in procedure caused a decrease of 28,896 from the number intensively examined during the previous fiscal year. The number of certificates issued has decreased proportionately to the number of aliens intensively examined.

Because of the reduction in the number of immigrants examined at Ellis Island, it has been possible to reduce materially the number of medical officers and clerical personnel on the line. As many medical officers as practicable have been detailed to the hospital and withdrawn temporarily, when necessary, to serve on the line or for boarding work.

On May 20, 1926, the intensive examination of alien seamen was inaugurated in accordance with bureau circular No. 481. From May 20 to June 30, 60,392 alien seamen entered the port of New York, of whom 48,031 were examined intensively and 209 were sent to Ellis Island for completion of diagnosis. One hundred and twenty-one of these were certified for class A-I and class A-II conditions, the remaining 88 being still under observation at the close of the fiscal year.

## NOYES, MINN.

Acting Asst. Surg. Frank B. McIntosh in charge.

The majority of aliens certified were non-English speaking, principally Europeans of Slavonic origin, many of whom had arrived in Canada from Europe but a few days before they presented themselves for admission to the United States. The remainder of the aliens who were unable to speak English came from settlements in various parts of Canada, some of them being of Canadian birth.

## PHILADELPHIA, PA.

Surg. F. A. Carmelia in charge.

During the fiscal year 1926 there was but a light inbound alien passenger movement through the port of Philadelphia.



Seventeen special medical boards were convened for the reexamination of aliens conditionally admitted into the country following initial certification of defects on arrival at other ports.

Philadelphia is being used increasingly as a port of deportation, and the immigration station and hospital at Gloucester, N. J., were occupied continuously by a large number of aliens awaiting deportation. These aliens were given a medical examination for record upon arrival in detention, and the sick were treated in the hospital. Twenty-four hundred medical examinations were made on such deportees and 1,693 medical treatments were given aliens awaiting deportation. The location of the hospital and detention building in Gloucester, N. J., necessitates almost daily inconvenient travel from the Philadelphia immigration office.

#### PHILIPPINE ISLANDS

Surg. H. F. Smith in charge.

Provision has been made for the medical inspection of aliens at all the ports of entry in the islands, namely, Cebu, Davao, Iloilo, Jolo, Legaspi, Manila, and Zamboanga. Since no vessels from foreign ports arrived direct at Davao or Legaspi, no inspections were made at those ports. No facilities exist at any of the ports of the Philippine Islands for the proper medical inspection of arriving aliens, but the examinations were conducted on board arriving vessels, in the quarantine offices, or at the customhouses.

The number of aliens inspected and certified were as follows:

Port	Inspected	Certified
Manila.....	10,793	57
Cebu.....	1	0
Davao.....	0	0
Iloilo.....	2	2
Jolo.....	138	10
Legaspi.....	0	0
Zamboanga.....	581	10
Total.....	11,515	79

The certifications were for the following causes:

Tuberculosis.....	1
Favus of the scalp.....	3
Gonorrhea.....	1
Leprosy.....	1
Ringworm of the scalp.....	40
Trachoma.....	3
Blindness.....	13
Paralysis.....	1
Uncinariasis.....	16
Total.....	79

The following table shows the nationalities represented by the aliens arriving during the years named:

Nationality	1920	1922	1924	1925
Chinese.....	14, 875	13, 954	12, 497	12, 207
Dutch and Flemish.....	81	73	63	63
East Indian.....	53	81	80	84
English.....	750	519	644	706
French.....	68	75	84	76
German.....	79	67	70	107
Irish.....	12	16	7	11
Italian.....	24	31	24	46
Japanese.....	952	584	968	1, 081
Portuguese.....	79	43	47	30
Russian.....	70	53	189	58
Scandinavian.....	33	42	71	41
Scotch.....	32	53	19	22
Spanish.....	563	375	403	401
Syrian.....	38	15	15	2
Turks.....	10	15	7	3
Other.....	133	54	63	138
	17, 852	16, 050	15, 251	15, 076

Boards of special inquiry and boards for determining the age of arriving aliens were convened almost daily.

Because of the prevalence of ringworm of the scalp and similar diseases, a considerable amount of laboratory work was necessary.

Aliens arrive on practically every passenger vessel, but since the total number is relatively small, there are no vessels engaged in exclusively immigrant trade.

#### PORT HURON, MICH.

Acting Asst. Surg. George M. Kesi in charge.

The overcrowded condition of the county jail at Detroit, Mich., resulted in the transfer of several large groups of detained aliens to the county jail at Port Huron. This increased number of detained aliens awaiting deportation in this city required frequent visits on the part of the medical officer to provide necessary attention in cases of illness.

Forty-five alien prisoners were treated 164 times at the county jail and 4 alien prisoners were provided with hospital treatment for a period of 26 days.

At the request of the Commissioner of Immigration and the district director of the United States Immigration Service at Detroit, Mich., the medical officer in charge made a sanitary survey of the St. Clair County jail and submitted a report covering the subject. No serious insanitary condition was discovered.

#### PRESIDIO, TEX.

Acting Asst. Surg. C. M. Hatcher in charge.

Immigration through this port has practically ceased, largely due to the immigration act of 1924 and the remoteness of the port from an American consulate. Most of the aliens examined were Mexicans from the neighboring town of Ojinaga and the surrounding territory.

Since the official personnel of the port consisted of but three persons, the medical officer served as a member of the board of special inquiry convened by the immigration officer.

## SAN FRANCISCO, CALIF.

Surg. Dunlop Moore in charge.

The activities of the service at this station may be discussed under the following headings: (1) Medical inspection of aliens, (2) hospital, (3) laboratory, (4) miscellaneous.

*Medical inspection of aliens.*—Again a falling off in the number of alien passengers arriving at this port as compared with the preceding year is noted. This phenomenon is ascribed to enforcement of the recent restrictive legislation and to unsettled political conditions in some parts of the Far East. It is noteworthy, however, that the number of alien passengers examined during the final quarter of the fiscal year was greatly in excess of the number for any similar period since the effective date of the immigration act of 1924.

While it is realized that the practice of conducting physical and mental examinations of alien steerage passengers on board ship is unsatisfactory in most respects, nevertheless, owing to factors not within the control of the medical officers, the number of steerage passengers remanded to the Angel Island immigration station for intensive medical examination shows a distinct diminution. Under present conditions at this port, not only are all cabin passengers medically inspected on board ship, but also the medical examination of certain classes of alien steerage passengers is habitually completed on shipboard, namely, those holding permits issued under section 10 of the immigration act of 1924 (so-called return permits) as well as rail and water "transits"; whereas at one time all steerage aliens, with few exceptions, were remanded to Angel Island for intensive medical examination. Viewed from a purely medical standpoint, the immigration station presents many important advantages as a place for conducting the careful physical and mental examinations contemplated in the immigration laws.

*Hospital.*—Of diseases requiring hospital treatment first in point of numbers was scabies, represented by 41 admissions, with two exceptions, all Chinese. Scabies is an extremely common skin affection among our Chinese, neglected and aggravated forms of the disease being frequently encountered. As a common sequela of this condition extensive pigmented areas, puzzling to the uninitiated, are often seen. In contrast to the frequency of scabies, the rarity of pediculosis among arriving Chinese is worthy of mention. Notable, too, is the entire absence from our hospital record for the fiscal year 1926 of such common infectious maladies as measles, scarlet fever, diphtheria, and whooping cough. Thus the hospital report apparently indicates improved sanitary conditions among arriving and detained aliens.

*Laboratory.*—The laboratory facilities, though somewhat limited, have proved of value in connection with the medical examination of aliens as well as of assistance in the diagnosis of hospital cases. A large proportion of the incoming aliens originate in the southern Chinese Province of Kwantung, whose indigenes present an intestinal fauna of perhaps unsurpassed richness and variety, so that the examination of feces has long been regarded as a most productive feature of the laboratory work. Stool examinations, though much fewer than in previous years, were made with results as follows:

	Number
Specimens of feces examined.....	953
Negative.....	333
Specimens containing ova of—	
<i>Ascaris lumbricoides</i> .....	441
<i>Trichuris trichiura</i> .....	246
Hookworm.....	118
<i>Clonorchis sinensis</i> .....	104
<i>Fasciolopsis buski</i> .....	7
<i>T. saginata</i> .....	4
<i>H. nana</i> .....	1
<i>Metagonimus yokogawai</i> .....	1
<i>Oxyuris vermicularis</i> .....	1
<i>Schistosoma mansoni</i> .....	1
Specimens containing larvae of <i>strongyloides stercoralis</i> .....	5

Needles to add, polyparasitism is of extreme frequency. The above table fairly represents the order of frequency of the more common helminths among the Chinese of Kwantung Province. First comes roundworm and second whipworm; hookworm and clonorchis are close contenders for third place, with *Fasciolopsis buski* and *Strongyloides stercoralis* following almost *pari passu* far behind.

*Miscellaneous.*—Among miscellaneous duties may be noted the following:

There were 1,377 out-patient treatments given to detained aliens and others suffering from minor ailments not requiring hospitalization.

One hundred and fourteen aliens and others were vaccinated against smallpox. It appears that for some time the local consul general of Mexico has required a vaccination certificate as a prerequisite to the deportation of his nationals.

With reference to their physical fitness to perform the duties of seamen, 138 aliens were specially examined prior to deportation, 5 of whom were found physically unfit.

Thirty-eight estimates of probable age were made and certificates of findings issued. In this connection special attention has been given to the possible effect of intestinal parasitism in retarding physical development.

Members of the hospital staff, when required, have appeared before local courts in connection with the commitment of aliens afflicted with mental disease or drug addiction and have made reexaminations of certified aliens.

Upon request of the Commissioner of Immigration, medical examinations have been made and certificates issued under Executive order of June 18, 1923, of applicants for positions in the local immigration service.

Analysis of the medical records of this station throws valuable light upon the nosogeography of Asia, a subject which, though still shrouded in much obscurity, possesses great present interest and greater potential importance to the American health officer. The diseases of the immigrant from the more enlightened countries of Europe are very similar to those prevailing among our own people; whereas in Asia, and particularly in southeastern Asia, endemic maladies which have not yet secured a foothold in any other part of the globe flourish. It has been customary to ascribe the localization of these diseases to the limited habitats of the intermediate host or hosts concerned, passage through one or more animal vectors being required for their transmission from man to man. Peculiar habits



of diet, climate, etc., have also been regarded as secondary etiological factors. It must be admitted that our knowledge of the pathogenicity and epidemiology of these maladies is far from complete. The records of this station also indicate that the human pathology of Asia when compared with that of the United States and Europe shows marked quantitative as well as qualitative dissimilarities. An everyday illustration of this fact is the tremendously high rate of infestation with roundworm found among southern Chinese, among whom, on the other hand, cestoda are practically unknown. A large number of such examples might be readily adduced.

The great Continent of Asia, out of which have emanated in the past most of the tremendous epidemics that have vexed the human race, may still retain within her bosom capabilities for evil toward which it behooves the health officer to assume a cautious attitude. A new era confronts us, and we have every reason to believe that in the immediate future the distances that have hitherto separated the circumpacific countries will be annihilated by the progress of invention and that the distinctions now existent between the nosology of these widely separated districts will tend to become obliterated. As a power with Asiatic dependencies, it is of interest to the United States to consider the possibility of maladies hitherto regarded as distinctively American thus gaining entrance into Asia. In this connection it is worthy of note that a medical officer of the United States Public Health Service was recently able to demonstrate conclusively the presence in Japan of tularæmia, a disease not previously described outside of the limits of the United States.

#### WINNIPEG, MANITOBA, CANADA

Asst. Surg. G. J. Van Beeck in charge.

As in previous years, all medical inspections were made in one room which forms part of the suit occupied by the immigration authorities. While the room in itself is adequate under present circumstances, it contains very little equipment, and this fact together with several others tends to make the inspections less thorough than is desired. Approximately 60 persons must be inspected daily, and each one singly in the order in which he arrives at the station. Further, there is no nurse or other female attendant and the station has no hospital connections. Without doubt, a number of certifiable conditions are not detected. As the station is situated in a foreign country, there are no detention quarters. Laboratory facilities are made available by various institutions in the city and their character is excellent.

On the whole, the class of aliens admitted through this port has been of the best. Over one-half were visitors, the majority of whom remained in the United States for a short period only. A considerable number crossed the boundary for the purpose of obtaining medical treatment, principally at the Mayo Clinic in Rochester, Minn. Of the total number admitted, approximately 80 per cent were Canadian citizens. The remainder (20 per cent) were of European nationality. Asiatic immigration through this port was so small as to be negligible. It is estimated that less than 2 per cent of the number admitted were not bona fide Canadian residents or immigrants, but were foreigners seeking entrance into the United States via Canada.

## EUROPEAN PORTS

Senior Surg. Taliaferro Clark in charge.

The development of the immigration policy of the United States has been very gradual and somewhat hesitant. With the enactment of the quota act of May 9, 1921, as amended by the act of May 11, 1922, limiting the number of aliens of any nationality to be admitted to the United States in any fiscal year, the Congress announced a very definite policy in respect of immigration. By the immigration act of 1924, consular officers are charged with the responsibility of issuing immigration visas to aliens about to visit the United States and directed to refuse visas to persons known to be inadmissible or whom they have reason to believe is inadmissible to the United States under the immigration laws. This is probably the most progressive step yet taken by the Congress to improve the character of immigration.

In the exercise of the functions conferred upon them by law, it soon became evident to consular officers that no great reliance could be placed on the statements of many local physicians in respect of the mental and physical status of applicants for visas, largely because of the disinclination of physicians of eminence to accept the responsibility, and in less degree because of the ignorance of others of the possible significance of certain physical and mental disabilities in relation to the enforcement of the immigration laws, which led to the issuance of improper medical certificates and the failure to issue certificates for conditions of serious import.

Based on reports received through the Department of State, the Surgeon General of the United States Public Health Service, with a view of overcoming this defect in the new system and minimizing the hardships of arriving aliens, submitted, on February 10, 1925, a memorandum to the Department of Labor and the Department of State on the advisability of undertaking experimental medical examinations of aliens at foreign ports and stations. Following the receipt of this memorandum, at the instance of the Secretary of Labor, a cooperative plan was worked out by representatives of the Departments of Labor, State, and Treasury, after a study of the situation abroad, in accordance with which, and with the consent of the Governments of Great Britain and the Irish Free State, medical officers of the United States Public Health Service were stationed at the consulates of Cobh and Dublin, Irish Free State; Belfast, Northern Ireland; Glasgow, Scotland; and Liverpool, London, and Southampton, England; to conduct the medical examinations of applicants for immigration visas for an experimental period of three months. This work was inaugurated under the supervision of Asst. Surg. Gen. J. W. Kerr.

On January 7, 1926, Senior Surg. Taliaferro Clark was directed to proceed to London, England, and establish headquarters at the American Consulate General at that place for the general supervision of medical examinations of aliens at selected ports of Great Britain and the Irish Free State and in continental Europe.

The success of the new system of medical examinations in safeguarding the interests of prospective immigrants, saving them from

loss of time and money in proceeding to the United States to learn whether or not they were admissible, and minimizing the annoyance and delay at ports of arrival excited wide interest, in consequence of which, through representation to the Department of State by the respective Governments, two new stations were opened on March 1, 1926, one at Antwerp, Belgium, and the other at Rotterdam, Holland. Through similar representation by other governments, plans were perfected and the necessary arrangements made by the close of the fiscal year to inaugurate medical examinations, with the beginning of the new fiscal year, July 1, 1926, at the following points: Berlin, Bremen, Cologne, Hamburg, and Stuttgart, Germany; Copenhagen, Denmark; Bergen and Oslo, Norway.

In the following statistical report of the work accomplished during this period it is borne in mind that the respective immigration quotas were practically exhausted for Belgium and Holland when the work was started. The number of applicants examined in these two countries by the end of the fiscal year was too small to have any great effect on the statistical results of the new system as a whole.

TABLE 1.—*Distribution according to class of applicants for immigration visas who were medically examined at each station, August 1, 1925, to June 30, 1926*

Name of station	Total number of applicants	Number of applicants in each class			Percentage of applicants in each class		
		Quota	Non-quota	Nonimmigrant	Quota	Non-quota	Nonimmigrant
Antwerp.....	266	175	91	0	65.79	34.21	0
Belfast.....	3,217	2,966	186	65	92.20	5.78	2.02
Cobh.....	9,721	9,435	244	42	97.06	2.51	.43
Dublin.....	15,092	14,818	245	29	98.19	1.62	.19
Glasgow.....	14,742	13,717	921	104	93.05	6.25	.70
Liverpool.....	5,927	5,292	610	25	89.29	10.29	.42
London.....	6,375	4,970	1,237	168	77.96	19.40	2.64
Rotterdam.....	601	503	92	6	83.69	15.31	1.00
Southampton.....	3,111	2,629	285	197	84.51	9.16	6.33
Total.....	59,052	54,505	3,911	636	92.30	6.62	1.08

The percentage of nonquota immigrants, under existing provisions of the immigration laws, probably will gradually decrease from year to year, since this class comprises the wives and children of United States citizens, returning aliens previously legally admitted to the United States, students, college professors, ministers and their wives and children under 18 years of age. On the other hand, the number of nonimmigrants medically examined will vary from year to year, depending on social, economic, and other conditions. Members of this class are referred for medical examinations by visa officers only when suspected or presenting evidences of mental or physical disabilities.

It is of interest to note, referring to Table 1, that approximately two-thirds of the total applicants were examined at three stations, namely, Cobh and Dublin, Irish Free State, and Glasgow, Scotland; and that, exclusive of Antwerp and Rotterdam, where comparison

is misleading owing to the small number, the highest percentages of nonquota immigrants were examined at Liverpool, London, and Southampton, and of the nonimmigrants at Belfast, London, and Southampton.

The percentage of the total applicants examined who were certified for mental and physical disabilities was highest at Belfast, Cobh, Liverpool, Rotterdam, and Dublin, in the order named.

TABLE 2.—*Number and percentage of applicants for immigration visas who were certified for different classes of disabilities*

Name of station	Total number of persons examined	Number certified for			Percentage of persons examined who were certified for		
		Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Antwerp.....	266	4	18	22	1.50	6.77	8.27
Belfast.....	3,217	10	701	711	.31	21.79	22.10
Cobh.....	9,721	277	1,515	1,792	2.85	15.58	18.43
Dublin.....	15,092	416	1,571	1,987	2.76	10.41	13.17
Glasgow.....	14,742	32	674	706	.22	4.57	4.79
Liverpool.....	5,927	65	980	1,045	1.10	16.53	17.63
London.....	6,375	16	473	489	.25	7.42	7.67
Rotterdam.....	601	6	75	81	1.00	12.48	13.48
Southampton.....	3,111	8	326	334	.26	10.48	10.74
Total.....	59,052	834	6,333	7,167	1.41	10.72	12.13

Variations in the percentage of certification for class A and class B defects at different stations are shown in a different way in Table 3.

TABLE 3.—*Percentage distribution of persons certified for disabilities according to class of condition*

Name of station	Percentage of certified persons who had—		
	Total, classes A and B	Class A conditions	Class B conditions
Antwerp.....	100	18.18	81.82
Belfast.....	100	1.41	98.59
Cobh.....	100	15.46	84.54
Dublin.....	100	20.94	79.06
Glasgow.....	100	4.53	95.47
Liverpool.....	100	6.22	93.78
London.....	100	3.27	96.73
Rotterdam.....	100	7.41	92.59
Southampton.....	100	2.40	97.60
All stations.....	100	11.64	88.36

The value of medical examinations at foreign ports is well set forth in the following table:



TABLE 4.—*Number and percentage of the total persons examined who were refused visas on medical certification for different classes of conditions*

Name of station	Total number of persons examined	Number refused visas for—			Percentage of persons examined who were refused visas for—		
		Class A conditions	Class B conditions	All conditions, classes A and B	Class A conditions	Class B conditions	All conditions, classes A and B
Antwerp.....	266	4	7	11	1.50	2.63	4.14
Belfast.....	3,217	10	242	252	.31	7.52	7.83
Cobh.....	9,721	277	548	825	2.85	5.64	8.49
Dublin.....	15,092	416	424	840	2.76	2.81	5.57
Glasgow.....	14,742	32	208	240	.22	1.41	1.63
Liverpool.....	5,927	65	560	625	1.10	9.45	10.54
London.....	6,375	16	244	260	.25	3.83	4.08
Rotterdam.....	601	6	40	46	1.00	6.66	7.65
Southampton.....	3,111	8	68	76	.26	2.19	2.44
Total.....	59,052	834	2,341	3,175	1.41	3.96	5.37

Approximately 5 out of every 100 applicants were refused immigration visas on medical certification. Excluding Antwerp and Rotterdam, where the numbers examined are too small for statistical comparison, the percentage of refusals of the total examined is fairly uniform, but is highest at the industrial center—Liverpool.

In respect of the number certified in each class (see Table 5), all of the applicants, or 100 per cent, certified as having class A defects, and approximately 37 out of every 100 certified as having a disease or defect potentially affecting their earning capacity were refused visas.

TABLE 5.—*Number and percentage of the total persons certified for each class of disability who were refused visas on medical grounds*

Name of station	Number of persons certified for—			Number of persons refused visas for—			Percentage of persons certified who were refused visas for—		
	Class A conditions	Class B conditions	All conditions, classes A and B	Class A conditions	Class B conditions	All conditions, classes A and B	Class A conditions	Class B conditions	All conditions, classes A and B
Antwerp.....	4	18	22	4	7	11	100	38.89	50.00
Belfast.....	10	701	711	10	242	252	100	34.52	35.44
Cobh.....	277	1,515	1,792	277	548	825	100	36.17	46.04
Dublin.....	416	1,571	1,987	416	424	840	100	26.99	42.27
Glasgow.....	32	674	706	32	208	240	100	30.86	33.99
Liverpool.....	65	980	1,045	65	560	625	100	57.14	59.81
London.....	16	473	489	16	244	260	100	51.59	53.17
Rotterdam.....	6	75	81	6	40	46	100	53.33	56.79
Southampton.....	8	326	334	8	68	76	100	20.86	22.75
Total.....	834	6,333	7,167	834	2,341	3,175	100	36.95	44.30

Of the total number of applicants certified, 44.30 per cent were refused visas, a number never approximated by medical examinations at ports of arrival. For example, in 1920, 333,727 aliens arrived at the port of New York. Of this number, 7,549, or 2.26 per cent, were medically certified, 0.11 per cent for class A defects and 1.89 per cent

for class B defects, respectively. Of the total certified, only 4.4+ out of 100 were deported, 57.6+ out of 100 class A cases and 1.9+ out of 100 class B cases, as compared with 100 per cent refusals for class A conditions and 37 out of 100 for class B certifications at foreign ports.

*Pending cases.*—Since the citizens of the Irish Free State did not apply for their full quota of visas during the late fall, winter, and early spring months, 10 per cent of the total quota for the year were examined each month during May and June, whereas usually the quota allotment is exhausted and the examinations are restricted to nonquota and a few nonimmigrant aliens. For this reason an unusually large number of certified cases was pending at the close of the fiscal year. It will be observed, on consulting Table 6, that of the total 630 cases pending, 492 were at Cobh and Dublin, Irish Free State.

TABLE 6.—*Number and percentage of cases pending at the close of the fiscal year*

Name of station	Number of persons		Number of cases pending	Percentage of the total examined that were pending	Percentage of the total certified that were pending
	Examined	Certified			
Antwerp.....	266	22	1	0.38	4.55
Belfast.....	3,217	711	33	1.03	4.64
Cobh.....	9,721	1,792	228	2.35	12.72
Dublin.....	15,092	1,987	264	1.75	13.29
Glasgow.....	14,742	706	36	.24	5.10
Liverpool.....	5,927	1,045	39	.66	3.73
London.....	6,375	489	18	.28	3.68
Rotterdam.....	601	81	7	1.16	8.64
Southampton.....	3,111	334	4	.13	1.20
Total.....	59,052	7,167	630	1.07	8.79

Estimated on the basis of rejections for the fiscal year, all other conditions being equal, approximately 279 pending cases will be refused visas. On this basis the 11 months' work would represent a total of 3,454 rejections instead of 3,175, or 5,850 per 100,000 examined instead of 5,370 per 100,000 examined.

COMPARISON OF RESULTS OBTAINED DURING DIFFERENT EXAMINATION PERIODS AND IN THE SEVERAL POLITICAL AREAS

In Table 7 may be seen the comparative results of the medical inspection of applicants for immigration visas during the experimental period, August 1–October 31, 1925; the remainder of the fiscal year, November 1, 1925–June 30, 1926; and the whole period of 11 months from the beginning of the work. In Table 8 may be seen the comparative results of medical inspection in Great Britain and the Irish Free State; in England, Scotland, and the North of Ireland; in the Irish Free State; and in Belgium and Holland. The statistics relating to the examinations made on the Continent are given simply as an indication of the trend of the work in Belgium and Holland. The relatively short period during which examinations were made (March–April) and the small number examined

in each country during this period militate against any accurate comparison of the results with those obtained in Great Britain and Ireland.

TABLE 7.—*Results of medical examination of applicants for immigration visas for two periods and for the whole 11 months*

	Total Aug. 1, 1925, to June 30, 1926	Nov. 1, 1925, to June 30, 1926	Aug. 1, 1925, to Oct. 31, 1925
Total examined.....	59,052	39,617	19,435
Percentage examined in each period.....	100.00	67.04	32.96
Total certified.....	7,167	5,168	1,999
Total certified, class A.....	834	632	202
Total certified, class B.....	6,333	4,536	1,797
Percentage of the total examined who were certified.....	12.13	13.04	10.28
Percentage of the total examined who were certified, class A.....	1.41	1.59	1.04
Percentage of the total examined who were certified, class B.....	10.72	11.45	9.24
Total refused visas.....	3,175	2,215	960
Total refused visas, class A.....	834	632	202
Total refused visas, class B.....	2,341	1,583	758
Percentage of the total examined who were refused visas.....	5.37	5.50	4.42
Percentage of the total examined who were refused visas, class A.....	1.41	1.59	1.04
Percentage of the total examined who were refused visas, class B.....	3.96	3.09	3.88
Percentage of the total examined who were refused visas.....	44.29	42.87	48.02
Percentage of the total certified who were refused visas, class A.....	11.63	12.24	10.10
Percentage of the total certified who were refused visas, class B.....	32.66	30.63	37.92

TABLE 8.—*Comparative results of medical examinations of applicants for visas for different geographic areas*

	England, Scotland, and north Ireland	Irish Free State	Total for Great Britain and Irish Free State	Belgium and Holland	Total
Total number examined.....	33,934	24,251	58,185	867	59,052
Percentage of the total examined in each area.....	57.46	41.06	98.52	1.48	100.00
Total number certified.....	3,285	3,779	7,064	103	7,167
Total number certified, class A.....	131	693	824	10	834
Total number certified, class B.....	3,154	3,086	6,240	93	6,333
Percentage of the total examined who were certified:					
Total.....	9.68	15.57	12.14	11.88	12.13
Class A.....	.39	2.85	1.41	1.15	1.41
Class B.....	9.29	12.72	10.72	10.73	10.72
Total number refused visas.....	1,453	1,665	3,118	57	3,175
Total number refused visas, class A.....	131	693	824	10	834
Total number refused visas, class B.....	1,322	972	2,294	47	2,341
Percentage of the total examined who were refused visas:					
Total.....	4.22	6.86	5.35	6.57	5.37
Class A.....	.38	2.85	1.41	1.15	1.41
Class B.....	3.89	4.00	3.75	5.42	3.96
Percentage of the total certified who were refused visas:					
Total.....	44.84	44.05	44.13	55.34	44.29
Class A.....	3.98	18.37	11.66	9.70	11.63
Class B.....	40.86	25.68	32.47	45.64	32.66

#### ANALYSIS OF RESULTS OBTAINED DURING THE EXPERIMENTAL PERIOD

Approximately one-third of the applicants were examined during the experimental period. It will be observed on consulting Table VII that the percentage of the total examined, certified for mental and physical disabilities, and refused visas on medical grounds were

lowest during the experimental (organization) period, not so low during the whole period August 1, 1925, to June 30, 1926, and highest during the period November 1, 1925, to June 30, 1926. These differences are largely the result of more complete orientation and organization of the working forces and the provision of better facilities for carrying on the medical examinations as the work progressed.

On the other hand, it will be observed that the percentage of the total certified who were refused visas is highest during the period of organization, less high for the whole period, and least for the period November 1, 1925–June 30, 1926. There are two reasons for this difference—the greater number of applicants with serious defects presenting themselves for examination during the period of organization, which was reduced later through (a) the educational effect of the medical examinations on potential applicants, and (b) the greater care exercised at subconsulates not to allot quota numbers to applicants to be referred to visa-control stations who were obviously suffering from serious physical or mental defects. In the second place, the decreased percentage of certified cases refused visas is in part due to the finer discrimination by visa-control officers, with increasing experience in the operation of the new system, in respect of the significance of certified defects in their relation to the mandates of the immigration laws.

*Results obtained in different racial groups.*—Approximately 40 per cent more applicants were examined in England, Scotland, and the north of Ireland than in the Irish Free State. On the other hand, approximately 6 per cent more of those examined in the Irish Free State were certified for mental and physical defects and about 2 per cent more were refused visas than in the group comprising England, Scotland, and the north of Ireland.

*Principal defects certified.*—An important index of the value of the medical inspections is the number and character of the defects certified. The relatively large number of mental conditions certified is most noticeable, due in large measure to the greater facilities for mental examinations afforded by the new system of medical examinations at foreign ports. The advantage of increased facilities and opportunity for making medical examinations at foreign ports is strikingly shown on comparing the results of examinations for tuberculosis made at the port of New York under the old system in 1920 and 1925, with the results of similar examinations made at foreign ports from August 1, 1925, to June 30, 1926. At New York during the fiscal years 1920 and 1925 the rates of certification for tuberculosis were 11.6 and 24.4 per 100,000, respectively, as compared with the rate of 137.3 for pulmonary tuberculosis and 172.8 for all forms per 100,000 among applicants examined at foreign ports, with 100 per cent rejections.

*Vaccination history and vermin infestation.*—A careful record of vaccination against smallpox and of vermin infestation was made of every applicant undergoing medical examination.



TABLE 9.—*Showing the vaccination history and the occurrence of vermin infestation of applicants for immigration visas*

Name of station	Number examined	Successfully vaccinated		Vermin infestation			
				Head		Body	
		Number	Percentage	Number	Percentage	Number	Percentage
Antwerp.....	266	115	43.23	4	1.50	0	0
Belfast.....	3,217	880	25.80	865	26.89	41	1.27
Cobh.....	9,721	3,693	37.99	6,765	69.59	208	2.14
Dublin.....	15,092	8,455	56.02	5,948	39.41	1,629	10.79
Glasgow.....	14,742	6,532	44.31	2,738	18.57	231	1.57
Liverpool.....	5,927	715	12.06	997	16.82	55	.93
London.....	6,375	1,142	17.91	0	0	0	0
Rotterdam.....	601	524	87.19	17	2.83	0	0
Southampton.....	3,111	1,225	39.38	91	2.93	8	.26
Total.....	59,052	23,231	39.34	17,425	29.51	2,172	3.68

Of the total number of applicants examined, 39.33 per cent, or 39,330 out of every 100,000, were successfully vaccinated. By successful vaccination is meant evidence of a "take" or an "immune reaction" within one year of the date of presentation for medical examination. The highest percentages of successful vaccinations were observed in Holland, in the Irish Free State, and at Glasgow, Scotland.

In respect of vermin infestation, the rate was 29,420 per 100,000 applicants for head lice and 3,670 per 100,000 for body lice. The heaviest infestation was observed among the applicants examined at Cobh and Dublin, Irish Free State, but an undue infestation was observed among the applicants for visas examined at Belfast, Glasgow, and Liverpool also.

#### THE ATTITUDE OF THE PUBLIC TOWARD THE EXAMINATIONS AND THE EDUCATIONAL EFFECT

The attitude of the general public toward the medical examinations is not conspicuously manifest. The relatively few who are familiar with the character and object of the work give it unqualified approval. The attitude of the applicants for visas may be characterized as receptive. The majority of them in some localities appear to have given the matter no deep thought. Individual opinion appears to be based largely upon the result of the application for a visa. If the visa is granted, the individual reaction is good, although a number of applicants rejected because of medical defects while regretting their failure to pass have expressed themselves as grateful for the information that saved them from the greater disappointment and expense the rejection at a port of arrival would have entailed.

With regard to the educational effect on individuals and communities, there appears to be no unanimity of opinion. In so far as an individual is concerned, the hygienic value of the examinations is doubtful, because the majority of the applicants were adults and their habits of personal hygiene had become fixed. However, it is an undoubted fact that as the work progressed larger and larger

numbers of the applicants presenting themselves for medical examination gave evidences of recent correction of dental defects, disinfection of vermin, and greater attention to personal appearance.

#### ADDITIONAL ACTIVITIES OF THE GENERAL SUPERVISOR

In addition to the exercise of general supervision of the immigration and quarantine activities of the service in Great Britain, Irish Free State, and Continental Europe, Senior Surg. Taliaferro Clark was detailed to represent the Public Health Service at the Congress of the Royal Institute of Public Health held at Bristol, England, May 19-24, 1926, and the International Sanitary Conference on the Health of Merchant Seamen, held at Oslo, Bergen, and Trondjhem, Norway, June 28-July 6, 1926. These assignments have been made the subject of special reports to the bureau.

## DIVISION OF SANITARY REPORTS AND STATISTICS

In Charge of Asst. Surg. Gen. B. J. LLOYD

Health conditions throughout the United States were generally good during the fiscal year ended June 30, 1926, although outbreaks of influenza and measles caused many deaths during the early months of the year 1926. The death rates from tuberculosis and diphtheria showed further decline for the calendar year 1925, and the infant-mortality rate for that year was favorable as compared with previous years, although very slightly higher than the rate for 1924.

Reports of the prevalence of communicable diseases from foreign countries were generally favorable. Most of the eastern countries which usually report the greatest number of cases of cholera, plague, and smallpox had fewer cases of these diseases than during the previous year. The malaria situation in eastern Europe appeared to be better, especially in Poland. A reduction in the number of cases of malaria was reported from Russia, although the disease still presents a serious problem in large areas of that country.

A marked reduction was noted in the number of cases of typhus fever in eastern Europe and in Russia.

On the other hand, the increase in the number of cases of smallpox in England and the failure of the people to use the means of control of this disease in many countries, including the United States, are discouraging features.

### MORBIDITY REPORTS

Each year shows some improvement in the reports of the prevalence of diseases dangerous to the public health received and published by the division of sanitary reports and statistics, but these reports are not as nearly complete, as accurate, or as detailed as they should be. This statement applies to both the reports from foreign countries and from the United States.

### COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS

The cooperation of State and local health officers is necessary in order to secure current information of the prevalence of diseases dangerous to the public health which is essential to the Public Health Service. In order to assist in getting reports of cases and to insure prompt transmission of reports to the Public Health Service, officers of State, county, and municipal health departments are appointed as officers of the Federal Government. Appointments of this nature have been made since 1913, and the plan has proved helpful in securing these desired reports.

At the end of the fiscal year there were 42 collaborating epidemiologists located in the health departments of States and 4,419 assistant collaborating epidemiologists in local health departments. The work in each State is under the direction of the collaborating epidemiologist, who is in most instances the State health officer, and all appointments are made on the recommendation of the State health officer. The salaries paid the collaborating and assistant collaborating epidemiologists are nominal—\$1 per annum.

The following table shows the States in which Federal appointments have been made and the number of officers in each State:

*Collaborating and assistant collaborating epidemiologists as of June 30, 1926*

State	Collaborating epidemiologists	Assistant collaborating epidemiologists	State	Collaborating epidemiologists	Assistant collaborating epidemiologists
Alabama.....	1	31	Montana.....	1	0
Arizona.....	1	14	Nebraska.....	1	96
Arkansas.....	1	215	New Jersey.....	1	0
California.....	1	286	New Mexico.....	0	25
Colorado.....	1	221	North Carolina.....	1	112
Connecticut.....	1	0	North Dakota.....	1	86
Delaware.....	1	0	Ohio.....	1	165
Florida.....	1	9	Oklahoma.....	1	80
Georgia.....	1	29	Oregon.....	1	103
Idaho.....	1	9	South Carolina.....	1	14
Illinois.....	1	105	South Dakota.....	1	84
Indiana.....	1	535	Tennessee.....	1	79
Iowa.....	1	314	Texas.....	1	322
Kansas.....	1	117	Utah.....	1	39
Kentucky.....	1	131	Vermont.....	1	10
Louisiana.....	1	18	Virginia.....	1	28
Maine.....	1	477	Washington.....	1	48
Maryland.....	1	78	West Virginia.....	1	77
Massachusetts.....	1	0	Wisconsin.....	1	229
Michigan.....	1	2	Wyoming.....	1	28
Minnesota.....	1	1			
Mississippi.....	1	83	Total.....	42	4,419
Missouri.....	1	119			

#### TELEGRAPHIC MORBIDITY REPORTS

Five States were added during the fiscal year ended June 30, 1926, to the list of States making weekly telegraphic reports of the prevalence of communicable diseases to the Public Health Service. They are Idaho, Pennsylvania, Rhode Island, Tennessee, and Utah. These reports are now received from 43 States and the District of Columbia.

The following is a list of the States which send these telegraphic reports:

Alabama.	Louisiana.	Oklahoma.
Arizona.	Maine.	Oregon.
Arkansas.	Maryland.	Pennsylvania.
California.	Massachusetts.	Rhode Island.
Colorado.	Michigan.	South Dakota.
Connecticut.	Minnesota.	Tennessee.
Delaware.	Mississippi.	Texas.
District of Columbia.	Missouri.	Utah.
Florida.	Montana.	Vermont.
Georgia.	Nebraska.	Virginia.
Idaho.	New Jersey.	Washington.
Illinois.	New Mexico.	West Virginia.
Indiana.	New York.	Wisconsin.
Iowa.	North Carolina.	Wyoming.
Kansas.	North Dakota.	



In addition to the regular weekly telegrams, State health officers inform the Public Health Service immediately of the presence of unusual diseases or sudden outbreaks of the more common diseases which might spread to other States.

These reports are compiled immediately upon receipt, and a mimeographed bulletin is sent to State health officers, which gives a summary of the prevalence of the principal communicable diseases throughout the United States during the preceding week. In addition, the reports are published in the weekly Public Health Reports.

#### MONTHLY STATE REPORTS

Information as to the geographic distribution of cases of communicable diseases within the respective States is given in the monthly reports received from State health officers. Owing to the limited appropriation available for printing, these reports have not been published in full since March, 1924, but the data are compiled and are available in the division.

#### ANNUAL STATE MORBIDITY REPORTS

The annual summary of notifiable diseases in the United States for the year 1924 was published during the fiscal year. It included statistics for all of the States except Utah. The District of Columbia, Hawaii, and Porto Rico were also included.

For the principal communicable diseases the tables give the number of cases and deaths for each disease in each State by months, the number of cases and deaths per thousand population in each State for the year, and the fatality rate or the number of cases reported for each death registered. For purposes of comparison the "estimated expectancy" is given. This is the estimated number of cases which might be expected in each State during each month, the estimate being based on the experience of the preceding nine years.

#### CITY REPORTS

Weekly reports of the number of cases of the principal communicable diseases and the deaths from these diseases were received during the fiscal year from about 560 cities in the United States.

The city reports are valuable, as they give the earliest current information as to the number of deaths from the different diseases reported. The cases of some diseases (influenza and pneumonia, for instance) are not well reported, and the information from the records of deaths is much more trustworthy.

Two summaries of the cases of communicable diseases and deaths from these diseases for the year 1924 were issued during the fiscal year. The first included cities having 100,000 population or over, and the second included cities of from 10,000 to 100,000 population.

#### MENTALLY DISEASED, FEEBLE-MINDED, AND EPILEPTIC

During the latter part of the fiscal year blanks were sent to institutions for the care of persons suffering from mental diseases, feeble-mindedness, and epilepsy for the purpose of securing comprehensive data on the number of persons suffering from these conditions who are confined in institutions in the United States.

The small force available for the work and the fact that this force was obliged to keep up its regular work of collecting morbidity reports, which are constantly increasing in volume, retarded the work, but at the end of the fiscal year monthly reports were coming in from 95 institutions, located in 31 States.

Whenever possible an endeavor was made to secure the necessary data for all the institutions in a State from the central State agency in charge of the institutions. This was found to be practicable in only a few States, however, as the central agencies in most States did not have the detailed data in such form as to make the figures comparable with those from other States.

State boards of control, hospital commissions, departments of public welfare, and other State agencies for the care of the unfortunate have cooperated with the Public Health Service in securing the information desired, and the superintendents of hospitals and institutions throughout the country have generally been willing to give the time and attention necessary to prepare the data needed.

A rough estimate indicated that reports were being received at the close of the fiscal year from about half of the institutions under State jurisdiction in the United States, and the number was constantly increasing.

The solution of many important public-health problems will probably be facilitated by definite information which can be obtained from comprehensive and trustworthy statistics from institutions of this kind. It is known that certain forms of psychosis are closely related to venereal diseases, but much light is needed on many phases of this and similar public-health problems, which can be supplied in part, at least, by properly prepared statistics, collected at regular intervals.

#### FOREIGN REPORTS

Pursuant to the provisions of the act of February 15, 1893, consular officers of the United States report to the Public Health Service the cases of communicable diseases and deaths from these diseases at ports and other places in all parts of the world. These reports are supplemented by reports of Public Health Service officers stationed abroad, by official communications and published reports from foreign governments, and by the publications of the League of Nations.

The health section of the secretariat of the League of Nations has enlarged its facilities for the collection and dissemination of information regarding the prevalence of dangerous communicable diseases in all parts of the world. Through the cooperation of national and local health authorities information of outbreaks of cholera, plague, smallpox, and other diseases is now collected regularly from the principal ports in the Far East and transmitted by radio broadcasts, cable, and printed publications to all parts of the world. Information of the prevalence of diseases in other regions is also collected and published in weekly, monthly, and annual bulletins by the health section. Improved means of communication and the consequent increased danger of the spread of communicable diseases have made this service invaluable to all nations. It is believed that in time the result will be an awakened interest in the collection of reports of diseases dangerous to the public health within national

boundaries, including the United States, and that public officials and the people generally will realize the futility of attempting to conceal the presence of these diseases and the advantage of the use of vigorous, sane measures to stamp out incipient epidemics before they are beyond control.

## PREVALENCE OF DISEASE

Preliminary reports for the United States indicate a low general death rate for the year 1925 (11.7 per hundred thousand population in 30 States). The infant mortality rate was also low (71.5 deaths of infants under 1 year of age per thousand births).

A widespread outbreak of respiratory diseases early in the year 1926 was largely responsible for high death rates for the country as a whole during the first four months of that year. An epidemic of measles about the same time caused many deaths among children. Detailed statistics for this period are not yet available.

The following table gives a comparison of the cases of the principal communicable diseases and the deaths from these diseases in 1925, with similar figures for the year 1924.

## CASES

Disease	Number of States <sup>1</sup>	Aggregate population (in thousands)		Cases		Cases per 100,000 population	
		1924	1925	1924	1925	1924	1925
Cerebrospinal meningitis.....	22	58,726	59,451	1,095	1,100	1.9	1.9
Chicken pox.....	33	84,598	85,670	162,930	133,100	192.6	155.4
Diphtheria.....	36	92,477	93,650	97,329	81,186	105.2	86.7
Influenza.....	36	92,477	93,650	.....	.....	.....	.....
Malaria.....	28	86,807	87,888	.....	.....	.....	.....
Measles.....	36	92,477	93,650	424,146	212,385	458.7	226.8
Mumps.....	28	77,021	77,990	104,324	70,575	135.4	98.2
Pellagra.....	28	80,291	81,307	.....	.....	.....	.....
Pneumonia (all forms).....	34	91,367	92,511	.....	.....	.....	.....
Polioomyelitis.....	28	74,746	75,698	4,488	4,293	6.0	5.7
Scarlet fever.....	36	92,477	93,650	160,569	165,946	173.6	177.2
Smallpox.....	36	92,477	93,650	39,463	26,741	42.7	28.6
Tuberculosis (all forms).....	36	92,477	93,650	.....	.....	.....	.....
Tuberculosis (pulmonary).....	31	88,960	90,057	.....	.....	.....	.....
Typhoid fever.....	35	89,448	90,592	26,876	36,287	30.0	40.1
Whooping cough.....	36	92,477	93,650	147,677	128,071	159.7	136.8

## DEATHS

Disease	Deaths		Deaths per 100,000 population		Deaths per 100 cases	
	1924	1925	1924	1925	1924	1925
Cerebrospinal meningitis.....	470	508	0.8	0.9	42.9	46.2
Chicken pox.....	101	83	.1	.1	.1	.1
Diphtheria.....	7,954	7,241	8.6	7.7	8.2	8.9
Influenza.....	16,367	25,844	17.7	27.6	.....	.....
Malaria.....	2,786	2,421	3.2	2.8	.....	.....
Measles.....	6,490	2,038	7.0	2.2	1.5	1.0
Mumps.....	57	65	.1	.1	.1	.1
Pellagra.....	2,006	3,044	2.5	3.7	.....	.....
Pneumonia (all forms).....	88,843	88,119	97.2	95.3	.....	.....
Polioomyelitis.....	812	1,075	1.1	1.4	18.1	25.0
Scarlet fever.....	2,717	2,437	2.9	2.6	1.7	1.5
Smallpox.....	813	595	.9	.6	2.1	2.2
Tuberculosis (all forms).....	78,379	76,605	84.8	81.8	.....	.....
Tuberculosis (pulmonary).....	65,203	64,666	73.3	71.8	.....	.....
Typhoid fever.....	5,352	7,430	6.0	8.2	19.9	20.5
Whooping cough.....	6,912	5,460	7.5	5.8	4.7	4.3

<sup>1</sup> In addition to the number of States given, the District of Columbia is included.

*Diphtheria.*—In 1925, 36 States reported 81,186 cases of diphtheria, which is 17 per cent less than the number in 1924. In these States diphtheria was responsible for 7,241 deaths during 1925 and 7,954 deaths in 1924. More than 85 per cent of the persons who die from diphtheria are children less than 10 years old. Use of diphtheria antitoxin promptly on the development of the early symptoms of the disease would have saved most of these lives, and the general use of proved methods of ascertaining whether an individual is susceptible to the disease and immunizing those who need protection would reduce the morbidity and mortality caused by diphtheria to a small fraction of the present figures.

The mortality from this disease has been reduced more than 70 per cent in the United States during the last 25 years, but a still greater reduction is possible.

*Influenza and pneumonia.*—Thirty-four States reported 113,762 deaths from influenza and pneumonia during 1925, which may be compared with 105,109 deaths during 1924. The death rates for the two diseases combined were 123 per hundred thousand in 1925 and 115 in 1924. These rates are higher than those for the years 1921 to 1923, but lower than the rates for the three years 1918 to 1920, which included the influenza pandemic of 1918-19.

During the first four months of the calendar year 1926 influenza was widely prevalent in the United States. Definite figures are not yet available except for certain population groups, but the general death rate in these groups was higher than it has been for several years.

*Malaria.*—Malaria is an important public-health problem in those parts of the country where it prevails. It is very difficult, however, to get current statistics of its prevalence, as many cases of the disease are not reported. Twenty-eight States reported 2,421 deaths from malaria in 1925 and 2,786 deaths in 1924.

*Measles.*—The figures for measles fluctuate widely both for different years in the same places and for different places in the same year. Thirty-six States reported 212,000 cases of measles in 1925 and about twice that number in 1924. The deaths from this disease in these States in 1925 (2,098) were about one-third of the number in 1924. However, during the early part of the calendar year 1926 measles was unusually prevalent throughout the eastern part of the country, and later the disease spread across the country to the Pacific coast.

*Pellagra.*—More than 3,000 deaths from pellagra were registered in 28 States in 1925. This is an increase of 50 per cent over the number in the same States in 1924. This disease is prevalent in nearly all of the Southern States.

*Poliomyelitis (infantile paralysis).*—Outbreaks of poliomyelitis occurred during the summer and early fall of 1925 in New York, Minnesota, Wisconsin, California, and other States. Twenty-eight States reported 1,075 deaths from acute poliomyelitis during 1925. In 1924 these States reported 812 deaths from this disease.

*Scarlet fever.*—The number of cases of scarlet fever reported in 1925 was somewhat greater than the number in 1924, but fewer deaths were registered in 1925. It is possible that the apparent increase in the number of cases was the result of more nearly complete reports of cases.



*Smallpox.*—During 1925, 36 States, having a population of 93,650,000, reported 26,700 cases of smallpox and 595 deaths. Most of the deaths from the disease occurred in a few cities where the virulent type of the disease appeared. Differences in the fatality rate of this disease are shown in the reports from the following cities: Los Angeles, Calif., 1,278 cases and 33 deaths; Oakland, Calif., 498 cases, no deaths; San Francisco, Calif., 205 cases and 15 deaths; San Diego, Calif., 439 cases and 2 deaths; Washington, D. C., 59 cases and 20 deaths; Indianapolis, Ind., 545 cases, no deaths; Minneapolis, Minn., 416 cases and 144 deaths; Omaha, Nebr., 559 cases, no deaths. Contrasts similar to these are frequent in the history of smallpox in recent years. For years cases of mild smallpox may be reported in a city with very few deaths. Then, without warning, virulent cases appear and many lives are sacrificed before belated vaccination checks the disease. This has been the experience of Los Angeles, Minneapolis, Washington, Philadelphia, Pittsburgh, and many other cities. Too frequently the vaccination is limited to contacts or persons living in certain sections, and later the disease breaks out again.

*Tuberculosis.*—During 1925, 36 States reported 76,605 deaths from tuberculosis. The death rate per hundred thousand population from this disease in these States decreased from 84.8 in 1924 to 81.8 in 1925. This reduction is a continuation of the general trend of this disease for at least a quarter of a century. If the tuberculosis death rate of 1900 (201.9 per hundred thousand) had prevailed in these 36 States during 1925 there would have been 189,000 deaths from this disease instead of 76,605, indicating a saving of more than 112,000 lives.

*Typhoid fever.*—Thirty-five States reported 36,000 cases of typhoid fever in 1925 and 27,000 cases in 1924. The deaths in these States from typhoid fever were: 1925, 7,430 deaths; 1924, 5,352. The increase is considerable, but the death rates from typhoid fever for recent years are all low as compared with typhoid fever rates of a decade or more ago. If the death rate in 1925 in the 35 States had been the same as the death rate in the registration area in 1900 (35.9 per hundred thousand) there would have been 32,300 deaths from this disease instead of 7,430. The increase in typhoid fever during 1925 was most marked in the rural population and small cities. The cities of 100,000 or more population showed a very slight aggregate increase over 1924. These large cities usually have better control over food, water, and milk supplies and better sewerage systems than the smaller places.

*Whooping cough.*—This disease was not as prevalent in the United States during 1925 as it was during 1924. Thirty-six States reported 5,460 deaths from whooping cough in 1925, which gives a rate of 5.8 deaths per hundred thousand population.

#### DISEASES IN FOREIGN COUNTRIES DURING 1925

*Cholera.*—During 1925 British India reported about 97,000 deaths from cholera, which is less than one-third of the number reported for 1924. Most of the cases of cholera were in Asia, and India is usually the principal focus. The Philippine Islands reported nearly a thou-

sand cases and more than 500 deaths during 1925, and the disease was unusually prevalent in Siam.

*Plague.*—This disease was reported from localities in all parts of the world, except Australia, during 1925, although the total number of cases and deaths was considerably less than the number for 1924. Plague was present in a number of South American countries, including Argentina, Brazil, Ecuador, and Peru. Comparatively few cases were reported from European countries, although the disease is likely to appear at any port without warning.

*Smallpox.*—As usual, smallpox was the most widely diffused of the quarantinable diseases. British India reported more than 40,000 deaths from this disease during 1925. In England there has been an increase in the number of smallpox cases each year since 1920. During 1925, 5,363 cases were reported, mostly in the northern counties. Fortunately the disease in England has been mild. The disease was present in Canada, and more than 1,200 cases were reported during 1925. In Mexico 8,735 deaths from smallpox were registered. The disease in Mexico is of the virulent type.

*Relapsing fever.*—Like typhus fever, relapsing fever has been decreasing in eastern Europe for several years. Comparatively few cases were reported from the northern coast of Africa, but in other parts of that continent there have been severe epidemics of the disease. Unfortunately, reports of the numbers of cases and deaths are not obtainable from some of the countries in Africa, where the disease has been prevalent. It has not been reported from the Western Hemisphere.

*Typhus fever.*—Since 1920 there has been a steady and rapid decline in the number of cases of typhus fever in eastern Europe. Poland reported 168,000 cases in 1920 and 4,200 cases in 1925. In European Russia, including Ukraine, more than 3,500,000 cases were reported in 1920 and 61,500 in 1925. In South America the disease is prevalent in Chile and Peru. It is endemic in Mexico.

*Yellow fever.*—This disease was reported from Senegal, Liberia, Ivory Coast, Gold Coast, and Nigeria, all in western Africa, during the calendar year 1925. It was not reported in the Western Hemisphere during that year, but in March, 1926, outbreaks were reported in some places in Brazil. For several years this disease has not been seen in many countries where only a few decades ago it was expected every year and where it made life uncertain for all persons who were not immune.

*Malaria.*—Malaria is a serious problem in some parts of Russia and in eastern Europe. In Poland the number of reported cases dropped from 53,000 in 1921 to 1,775 in 1925. In Russia, in 1925, 5,125,000 cases were reported, which is 859,000 less than the number reported in 1924.

Although malaria is prevalent in many countries, reports of its prevalence are incomplete and it is difficult to secure definite reports from many localities where it is known to prevail.

*Trachoma.*—In localities where it is prevalent this disease causes much suffering and frequently results in blindness. In many countries the disease appears to be increasing, but part of the apparent increase may be due to the discovery of old cases in the course of efforts to control the disease. European Russia reported nearly 670,000 cases in 1925 and 436,000 cases in 1924.

*Influenza.*—In most European countries for which figures are available the incidence of influenza was less in 1925 than in 1924, but Russia reported 2,606,000 cases in 1925, as against 1,854,000 cases in 1924.

*Anthrax.*—This disease is of interest because of the danger of infection from imported hides, wool, hair, bristles, and other commodities. The disease prevails, however, among both animals and human beings in parts of the world where it is impossible to secure accurate reports of its prevalence. The available reports indicated little difference between 1924 and 1925 in the number of cases.

#### SANITARY LEGISLATION AND DECISIONS

*State and Federal laws and regulations.*—During the fiscal year the work of collecting and compiling State and Federal public-health laws and regulations was continued. Two completed volumes of such laws and regulations were received from the Printing Office during this period. One (Supplement 49) was the compilation for the year 1923, and the other (Supplement 51) was the 1924 compilation. With the exception of a few States, the compilation for the year 1925 was ready for the printer at the close of the fiscal year. The publication of annual compilations of State laws and regulations was started in 1911.

*Smallpox vaccination laws, regulations, and court decisions.*—During the year work was commenced on a compilation of the various State laws and regulations pertaining to smallpox vaccination. Abstracts of court decisions on the subject of vaccination will also be included in the volume. When completed the compilation will show the existing provisions of law governing vaccination.

*Municipal ordinances and regulations.*—Copies of public-health ordinances and board of health regulations adopted during the year 1925 were secured from cities in the United States having a population of more than 10,000 in 1920 for use in a compilation of municipal sanitary legislation covering the three-year period 1923–1925. This volume when issued will be the latest in a series of compilations of municipal ordinances and regulations pertaining to public health dating from 1910.

*Court decisions.*—The abstracting and publication in the Public Health Reports of current decisions of State and Federal courts of last resort on matters pertaining to public health and sanitation was continued throughout the year. In addition there was issued a digest (Supplement 56) of all court decisions relating to public health which had been abstracted and published currently in the Public Health Reports during the years 1919 to 1925, inclusive.

*Comptroller General's decisions.*—The abstracting of current decisions of the Comptroller General of the United States on matters relating to the Public Health Service was continued, this work being done with a view to the possible future publication of these abstracts for the benefit and use of the personnel of the Public Health Service.

*Requests for information.*—Many inquiries were received during the year for information concerning legislation and court decisions on particular subjects of public-health interest. These requests were complied with to the fullest extent possible with the limited personnel.

## PUBLICATIONS ISSUED BY THE DIVISION

The Public Health Reports (vol. 40, pt. 2, and vol. 41, pt. 1) was issued each week during the fiscal year. It contained current information regarding the prevalence of communicable diseases in the United States and of the major quarantinable diseases in foreign countries, together with notes on administrative and preventive measures. In addition, the Public Health Reports contained articles presenting the results of investigative and research work by investigators of the Public Health Service in the various fields of sanitary and related sciences, abstracts of court decisions relating to public health, public-health engineering abstracts, and other articles dealing with subjects of especial interest to public-health authorities, sanitarians, and public-health workers generally. Approximately one-half of the material consisted of statistical data relating to current-disease prevalence, printed in tabular form, and the other half of text articles. The Public Health Reports during the fiscal year contained 2,835 pages, exclusive of title pages, tables of contents, and indexes, as compared with 3,094 pages in the preceding year, 3,245 in 1924, and 3,139 in 1923.

Sixty-seven of the text articles (1,010 pages) were issued as reprints, affording a more economical distribution.

Eight supplements to Public Health Reports were issued during the year—Supplements 49 and 51 (772 pages) being compilations of State laws and regulations relating to the public health, adopted during 1923 and 1924, respectively; Supplement 56 (66 pages), a digest of court decisions on public-health subjects; and Supplements 52, 53, 54, 55, and 57 (186 pages) being committee and conference reports and special articles relating to some field of research.

Revised editions of 20 previously issued reprints or supplements were published during the year.

## SECTION OF PUBLIC HEALTH EDUCATION

During the fiscal year ended June 30, 1926, 83 new publications were handled, as compared with 123 during the preceding year. The reduction in the number of new publications during the year was due to economies necessitated by a reduced printing fund. The total number of copies of these publications and of reprints of previous documents distributed aggregated 352,890 as compared with 379,957 during the preceding fiscal year. The smaller distribution was due principally to the reduction in the size of the editions. The 352,890 publications sent in response to 28,585 public requests do not include those printed and distributed by the division of venereal diseases.

There were 62 requests for the loan of stereopticon slides during the year. A total of 5,320 slides were loaned to universities, officials of the Public Health Service, sanitarians, and others, in response to these requests. The work of the stereopticon library has been greatly handicapped during the past few years owing to the shortage of slides and to the lack of funds for making new slides and replacing those which have been broken in transit.

Literature and lantern slides were furnished by this section for exhibition at the Sesquicentennial Exposition which opened in Philadelphia June 1, 1926.



Many requests have been received for the loan of exhibit material, posters, mats, and motion pictures, but, because of the lack of funds, compliance with most of these requests has been impossible.

The mailing list for weekly Public Health Reports was thoroughly revised during the year, resulting in a reduction of 565 names.

### HEALTH INFORMATION BY RADIO

The dissemination of health information by radio and through popular articles in newspapers and magazines was continued as heretofore, articles being published in 18 languages, including English. This service showed a marked increase over that of the last fiscal year.

### LIST OF PUBLICATIONS

The following is a list of publications issued during the fiscal year:

#### REPRINTS FROM THE PUBLIC HEALTH REPORTS

1003. Public Health Service Publications. A List of Publications Issued During the Period April, 1924, to March, 1925. April 10, 1925. 7 pages.
1011. Cooperative County Health Work. By Thomas Parran, Jr. May 15, 1925. 10 pages.
1012. Whole-Time County Health Officers, 1925. May 15, 1925. 5 pages.
1013. Status of Vaccination in American Colleges. By Robert T. Legge. May 22, 1925. 5 pages.
1014. The Supplying of Drinking Water to Vessels in the United States. By Joel I. Connolly and A. E. Gorman. May 22, 1925. 14 pages.
1015. The Effective Agent in the Prevention or Alleviation of the Chittenden-Underhill Pellagra-Like Syndrome in Dogs. By Frank P. Underhill and Lafayette B. Mendel. May 29, 1925. 4 pages.
1016. Biological Products. Establishments Licensed for the Propagation and Sale of Viruses, Serums, Toxins, and Analogous Products. May 29, 1925. 4 pages.
1017. Studies on Oxidation-Reduction. VIII. Methylene Blue. By W. Mansfield Clark, Barnett Cohen, and H. D. Gibbs. June 5, 1925. 70 pages.
1018. A Method for the Examination of Nearsphenamine and Sulfarsphenamine. By Eliás Elvove. June 12, 1925. 15 pages.
1019. Canyon Automobile Camp, Yellowstone National Park. By Isador W. Mendelsohn. June 12, 1925. 12 pages.
1020. An Outbreak of Typhoid Fever Caused by Milk-Borne Infection. By L. L. Lumsden. June 19, 1925. 15 pages.
1021. Tetanus in the United States Following the Use of Bunion Pads as a Vaccination Dressing. By Charles Armstrong. June 26, 1925. 6 pages.
1022. Studies of Impounded Waters in Relation to Malaria. By E. H. Gage. June 26, 1925. 19 pages.
1023. Some Properties of Iron Compounds and Their Relation to Water Clarification. By Lewis B. Miller. July 3, 1925. 8 pages.
1024. The Chronological Development of Federal Health Legislation and Public Health and Medical Activities. By James A. Tobey. July 3, 1925. 5 pages.
1025. City Health Officers, 1925. Directory of Those in Cities of 10,000 or More Population. July 3, 1925. 12 pages.
1026. The Bio-Assay of Thyroid. By Reid Hunt. July 10, 1925. 6 pages.
1027. Standardization of Pollen Extracts by the Complement-Fixation Test. By Charles Armstrong and W. T. Harrison. July 10, 1925. 6 pages.
1028. Notes on the Clarification of Colored Waters. By Lewis B. Miller. July 10, 1925. 9 pages.
1029. Drinking Water Standards. Standards Adopted by the Treasury Department June 20, 1925, for Drinking and Culinary Water Supplied by Common Carriers in Interstate Commerce. April 10, 1925. 28 pages.
1030. The Rat-Proofing of Vessels. By S. B. Grubbs and B. E. Holsendorf. July 17, 1925. 9 pages.

1031. Strabismus and Defective Color Sense Among School Children. By Selwyn D. Collins. July 17, 1925. 9 pages.
1032. A Plan to Establish in the United States a Morbidity Registration Area; That is, an Area for the More Complete Collection of Data Relating to the Diseases of Man. By B. J. Lloyd. July 24, 1925. 12 pages.
1033. Studies on the Industrial Dust Problem. III. Comparative Field Studies of the Palmer Apparatus, the Konimeter, and the Impinger Methods for Sampling Aerial Dust. By Leonard Greenburg. July 31, 1925. 13 pages.
1034. The Trend of Pneumonia in Massachusetts. By Eugene R. Kelley and Angeline D. Hamblen. August 7, 1925. 14 pages.
1035. The Legal Authority and Limitations Governing Federal Public Health Activities. By J. W. Kerr. August 14, 1925. 10 pages.
1036. The Administration of Mercurial Preparations in Leprosy. Preliminary Report I—Mercurochrome Soluble 220. By Oswald E. Denney, Ralph Hopkins, Jerald G. Wooley, and Boyd G. Barentine. August 28, 1925. 14 pages.
1037. Destruction of Cockroaches and Dévitalization of Their Eggs by Cyano-gen-Chloride Mixture. By C. E. Rice. 3 pages.
1038. The Notifiable Diseases. Prevalence During 1924 in Cities of Over 100,000 Population. September 4, 1925. 32 pages.
1039. A Comparative Study of Rat-Flea Data for Several Seaports of the United States. By Carroll Fox and E. C. Sullivan. September 11, 1925. 26 pages.
1040. A Disease in Wild Rats with Gross Pathology Resembling Plague. By N. E. Wayson. September 18, 1925. 5 pages.
1041. A Note on the Method Used to Prevent the Importation of Smallpox into the Philippine Islands. By H. F. Smith and R. W. Hart. September 18, 1925. 4 pages.
1042. Stream Pollution by Wastes from By-Product Coke Ovens. A Review, with Special Reference to Methods of Disposal. By R. D. Leitch. September 25, 1925. 6 pages.
1043. State and Insular Health Authorities, 1925. Directory, with Data as to Appropriations and Publications. September 25, 1925. 21 pages.
1044. The Accuracy of Certified Causes of Death. Its Relation to Mortality Statistics and the International List. (Committee Report.) October 2, 1925. 43 pages.
1045. Relative Values of Methods of Enumerating Bacteria in Air. By W. J. McConnell and B. G. H. Thomas. October 9, 1925. 11 pages.
1046. Studies of Impounded Waters in Relation to Malaria. The Trend of Malaria in Horse Creek Valley, Aiken County, S. C. By E. H. Gage. October 16, 1925. 9 pages.
1047. Cooperative Rural Health Work of the Public Health Service in the Fiscal Year 1925. By L. L. Lumsden. October 23, 1925. 35 pages.
1048. The Notifiable Diseases. Prevalence During 1924 in Cities of 10,000 to 100,000 Population. October 30, 1925. 107 pages.
1049. A Demonstration at Tarboro, N. C., of a System for Sanitary Control of Milk Supplies of Towns and Small Cities, with special reference to operation of a municipal Pasteurization plant. By K. E. Miller. November 6, 1925. 12 pages.
1050. Public Health Nursing. By J. G. Townsend. November 6, 1925. 8 pages. 5 cents.
1051. Reinoculation as a Criterion of Cure of Experimental Syphilis, with Reference to Arsphenamine, Neoarsphenamine, and Sulpharsphenamine. By Carl Voegtlin and Helen A. Dyer. November 13, 1925. 9 pages.
1052. Water Hyacinth and the Breeding of Anopheles. By M. A. Barber and T. B. Hayne. November 20, 1925. 6 pages.
1053. Heredity and Culture as Factors in Body Build. By C. B. Davenport and Louise A. Nelson. November 27, 1925. 5 pages.
1054. Results of Schick Tests in California. By Frank L. Kelly, Ida May Stevens, and Margaret Beattie. December 4, 1925. 14 pages.
1055. Public Health Service Publications. A list of publications issued during the period April–October, 1925. December 4, 1925. 4 pages.
1056. The Notifiable Diseases. Prevalence in States, 1924. December 18, 1925. 92 pages.
1057. The Tenth Revision of the United States Pharmacopoeia. By George B. Roth. December 25, 1925. 10 pages.

1058. Cancer Mortality in the Ten Original Registration States. Trend for the period 1900-1920. By J. W. Schereschewsky. January 1, 1926. 12 pages.
1059. Smallpox Vaccination as Carried out at Lehigh University. By Stanley Thomas. January 8, 1926. 8 pages.
1060. Sickness Among Industrial Employees. Incidence and duration of disabilities from important causes lasting longer than one week among 133,000 persons in industry in 1924, and a summary of the experience for 1920-1924. January 22, 1926. 19 pages.
1061. Some Nutrition Experiments with Brewers' Yeast, with especial reference to its value in supplementing certain deficiencies in experimental rations. By Maurice I. Smith and E. G. Hendrick. February 5, 1926. 7 pages.
1062. A Further Study of Butter, Fresh Beef, and Yeast as Pellagra Preventives, with Consideration of the Relation of Factor P-P of Pellagra (and Black Tongue of Dogs) to Vitamin B. By Joseph Goldberger, G. A. Wheeler, and R. D. Lillie. February 19, 1926. 22 pages.
1063. Stream Pollution. I. A review of the Work of the United States Public Health Service in Investigations of Stream Pollution. By W. H. Frost. January 15, 1926. II. The Rate of Deoxygenation of Polluted Waters. By Emery J. Theriault. February 5, 1926. III. The Rate of Atmospheric Reaeration of Sewage-Polluted Streams. By H. W. Streeter. February 12, 1926. IV. Quantitative Studies of Bacterial Pollution and Natural Purification in the Ohio and Illinois Rivers. By J. K. Hoskins. February 19, 1926. 51 pages.
1064. Four Cases of Tularaemia (Three Fatal) with Conjunctivitis. By H. L. Freese, G. C. Lake, and Edward Francis. February 26, 1926. 4 pages.
1065. A Community Health Program. By Hugh S. Cumming. February 26, 1926. 10 pages.
1066. Division of Venereal Diseases, July 1-December 31, 1925. March 5, 1926. 2 pages.
1067. Rocky Mountain Spotted Fever. A study of the relationship between the presence of rickettsia-like organisms in tick smears and the infectiveness of the same ticks. By R. R. Parker and R. R. Spencer. March 12, 1926. 9 pages.

## SUPPLEMENTS TO THE PUBLIC HEALTH REPORTS

49. State Public Health Laws and Regulations Adopted During 1923. Compiled by Jason Waterman and William Fowler. 1925. 485 pages.
51. Public Health Laws and Regulations Adopted During 1924. Compiled by Jason Waterman, LL. B., and William Fowler, LL. B. 1925. 287 pages.
52. The Standardization of Digitalis. A comparative study of some of the methods of assaying digitalis, with a description of an improved modification of the one-hour frog method. By Maurice I. Smith and Wm. T. McClosky. 1925. 23 pages.
53. Report of Committee on Sanitary Control of the Shellfish Industry in the United States. November 6, 1925. 17 pages.
54. Studies on Oxidation-Reduction. IX. A Potentiometric and Spectrophotometric Study of Meriquinones of the P-Phenylene Diamine and the Benzidine Series. By W. Mansfield Clark, Barnett Cohen, and H. D. Gibbs. December, 1925. 61 pages.
55. Studies on Oxidation-Reduction. X. Reduction Potentials in Cell Suspensions. By R. K. Cannan, Barnett Cohen, and W. Mansfield Clark. January, 1926. 34 pages.
56. Court Decisions Relating to Public Health. Digest of Decisions Abstracted and Published Currently in Public Health Reports During Period 1919-1925. Prepared by William Fowler. 1926. 66 pages.

## PUBLIC-HEALTH BULLETINS

148. Mental Hygiene with Special Reference to the Migration of People. By Walter L. Treadway. February, 1925. 190 pages. 25 cents.
153. A Study of the Top Minnow *Gambusia Holbrooki* in its Relation to Mosquito Control. By Samuel F. Hildebrand. May, 1925. 136 pages.
154. Transactions of the Fifth Annual Conference of State Sanitary Engineers, held at Cincinnati, Ohio, May 26, 27, and 28, 1924. April, 1925. 160 pages.

155. The Course of Cancer Mortality in the Ten Original Registration States for the 21-Year Period, 1900-1920. By J. W. Schereschewsky. June, 1925. 118 pages.
156. Transactions of the Fifth Conference of Malaria Field Workers. Held at New Orleans, Louisiana, November 25 and 26, 1924. August, 1925. 142 pages.
157. Health Hazards of Brass Foundries. I. Field Investigations of the Health Hazards of the Brass-Foundry Industry. II. Laboratory Studies Relating to the Pathology of Brass Foundrymen's Ague. By John Arthur Turner and L. R. Thompson. August, 1925. 75 pages.
158. Proceedings of a Conference to Determine Whether or Not There is a Public Health Question in the Manufacture, Distribution, or Use of Tetraethyl Lead Gasoline, Held at Washington, D. C., May 20, 1925. August, 1925. 116 pages.
159. Studies in Natural Illumination in School Rooms. Parts I and II. A Report on the Observations of Daylight Illumination of Selected Classrooms of Different Orientation During the Period of an Entire School Year. By Taliaferro Clark and Arthur F. Beal. January, 1926. 57 pages.
160. Transactions of the Sixth Annual Conference of State Sanitary Engineers. Held at Louisville, Kentucky, April 25 and 27, 1925. January, 1926. 142 pages.
161. Transactions of the Twenty-Third Annual Conference of State and Territorial Health Officers with the United States Public Health Service, held at Washington, D. C., June 1 and 2, 1925.

## HYGIENIC LABORATORY BULLETINS

142. Key-Catalogue of the Worms Reported for Man. By C. W. Stiles and Albert Hassall. January, 1926. 196 pages.
143. Studies on *Brucella* (*Alkaligenes*) *Melitensis*. By Alice C. Evans. August, 1925. 67 pages.
144. Digest of Comments on the Pharmacopoeia of the United States of America and on the National Formulary for the Calendar Year Ended December 31, 1922. By A. G. DuMez. April, 1926. 272 pages.

## MISCELLANEOUS PUBLICATIONS

11. Official List of Commissioned and Other Officers of the United States Public Health Service; also List of U. S. Marine Hospitals, Quarantine, Immigration, Relief Stations, and Quarantine Vessels. July 1, 1925. 71 pages.



## DIVISION OF MARINE HOSPITALS AND RELIEF

In Charge of Asst. Surg. Gen. F. C. SMITH

The demands for medical relief have been undiminished, and the resources of the service have been severely taxed to supply basic requirements. The increase in Coast Guard personnel and the natural growth of the businesses in which beneficiaries are employed serve automatically to increase the responsibilities of the service from year to year.

### ECONOMIES

Without pride of achievement, a further reduction in the operating costs of the marine hospitals is again reported. The average per diem cost of all hospitals has been gradually reduced from \$4.08 in 1923, \$3.89 in 1924, and \$3.80 in 1925 to \$3.71, a point below the minimum compatible with full efficiency and much lower than the operating costs in hospitals of the Army, Navy, or Veterans' Bureau. The appropriations having been reduced, the amount expended on relief work was \$86,294 less than for the preceding year. It was therefore necessary to limit the amount of hospital relief, and 20,743 less patient days were furnished. Otherwise, a lowered standard of hospital care would have brought forth criticism from both beneficiaries and shipowners, who naturally expect the most prompt return to maritime duties that modern hospital facilities will permit. The unit cost of treatment has indeed been reduced, but it is not possible to state that the necessary Federal work has been done and done well, because the lack of funds has limited the amount of relief that it was possible to furnish and called for some sacrifice in efficiency.

The replies from medical officers in charge of various stations, some of which are quoted below, that were received in response to bureau admonitions regarding further economies, reveal the state of mind at representative relief stations. They indicate that the limit of economy has been reached and that further restriction can but result in vexation and general dissatisfaction.

*Stapleton, February 17, 1926.*—Expenditures have been reduced as far as is consistent with satisfactory service, and perhaps they have gone even beyond that.

*Hudson Street, New York City, February 20, 1926.*—It is not seen how this station can diminish its professional personnel unless it ceases some of the work which it is now doing.

*Savannah, February 19, 1926.*—No further reductions can be made consistent with efficient administration.

*Cleveland, February 17, 1926.*—No avenue of further curtailment is evident.

*Detroit, February 19, 1926.*—No further decrease of expenditures can be anticipated without a further lowering of hospitalization standards.

*Mobile, February 18, 1926.*—Any material reduction in the ratio of current expenses could but result in a degree of efficiency below that of the usual hospital standards.

*Buffalo, January 7, 1926.*—With the existing status of the appropriations it may not be good judgment for us to attempt to improve our service, as better service would undoubtedly mean more patients and more work, which in turn would mean greater expenses.

*March 22, 1926.*—We do not see at this time where further reduction in expenses can be made without changing materially the quality and efficiency of the service rendered.

*Baltimore, February 25, 1926.*—No further reductions are consistent with efficient administration.

*Fort Stanton, February 24, 1926.*—This hospital is being conducted with a minimum of expenditure, and it is not possible to reduce it without lowering the standards of hospital service rendered.

*Boston, January 20, 1926.*—It is hard for us to understand the continued reduction in the funds because of the fact that we have economized in every way we know possible other than taking measures that would cripple hospital administration.

### UNITED STATES COAST GUARD

The Public Health Service is designated by law as the medical corps for the Coast Guard. Hospital and out-patient treatment are furnished, and medical boards serve to maintain a proper physical standard among recruits, both of officers and enlisted personnel, and regulate retirements, promotions, and separations. Medical and surgical supplies are furnished to ships and shore stations, and medical and dental officers are detailed from this service to the Coast Guard for assignment to cruising cutters or elsewhere as the commandant may find necessary.

Surg. J. M. Gillespie was continued at Coast Guard headquarters as medical aid to the commandant to supervise the medical relief and act as liaison officer with the Public Health Service. He reports that the personnel of the Coast Guard throughout the fiscal year ended July 1, 1926, averaged 9,839, an increase over last year of 2,762, or about 39 per cent. He believes that a further increase for the ensuing year of 1,135 will occur, and estimates that this additional personnel will require approximately 12,000 additional hospital days, 14,000 out-patient treatments, and 2,000 physical examinations.

#### *Numerical strength of Coast Guard and medical services given*

Year	Number of Coast Guard personnel	Hospital days	Out-patient treatments	Physical examinations
1923.....	4,684	41,681	32,530	4,207
1924.....	4,896	36,504	45,857	7,008
1925.....	7,077	60,336	90,494	13,394
1926.....	9,839	71,799	125,226	19,061

#### *Average amount of medical service per person*

Year	Hospital days	Out-patient treatments	Physical examinations
1923.....	8.9	6.7	0.9
1924.....	7.6	9.4	1.5
1925.....	8.5	12.8	1.9
1926.....	7.7	12.7	1.9

Fig. 1

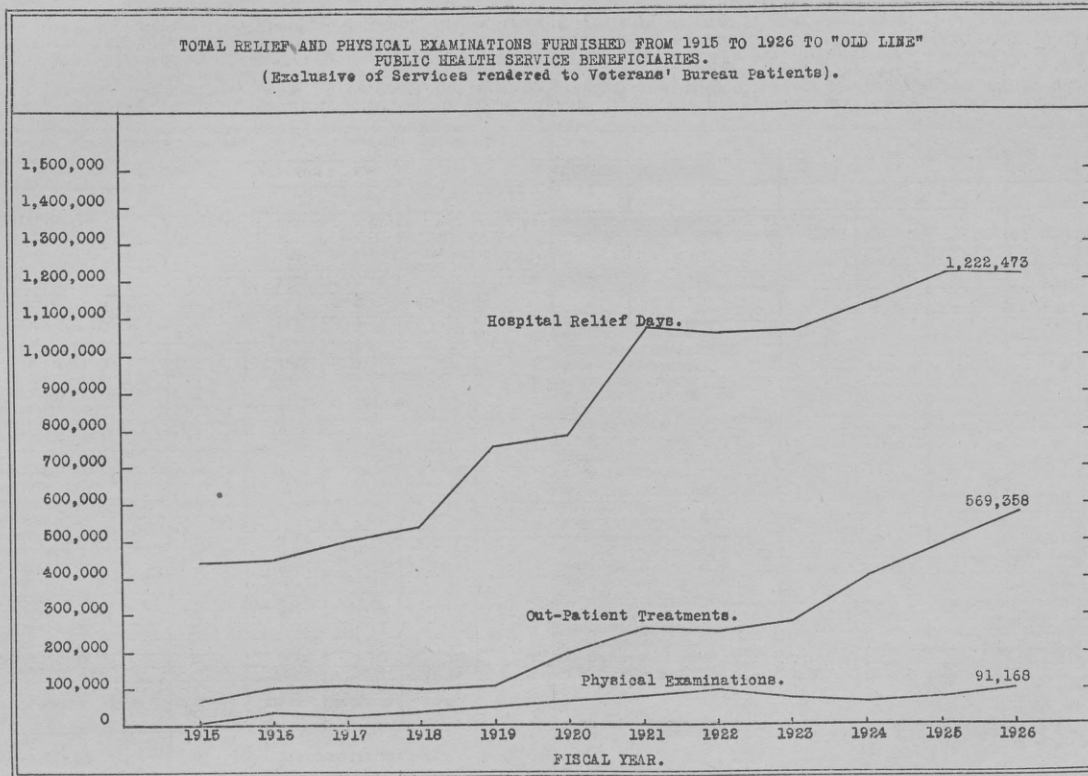






FIG. 2.—AVERAGE PER DIEM COST OF IN-PATIENT RELIEF, U. S. MARINE HOSPITALS, FISCAL YEAR 1926

GROUP OF HOSPITALS	HOSPITAL		COST PER PATIENT DAY					SALARIES  FOOD  OTHER  STATION RATION PRODUCTION 								
	NO.	LOCATION	RELIEF DAYS	TOTAL	SALARIES	FOOD	OTHER	1	2	3	4	5	6	7	8	9
General	1	Baltimore, Md.	54,884	\$5,48	\$2.14	\$ .67	\$ .67									
	2	Boston, Mass.	48,949	3.68	2.05	.65	.93									
	3	Buffalo, N. Y.	22,564	4.06	2.20	.61	1.25									
	5	Chicago, Ill.	42,719	4.49	2.50	.68	1.31									
	6	Cleveland, Ohio	27,570	4.48	2.84	.65	.99									
	7	Detroit, Mich.	25,688	4.09	2.31	.69	1.09									
	8	Evansville, Ind.	14,338	3.55	2.27	.57	.69									
	10	Key West, Fla.	9,240	4.59	2.29	.72	1.58									
	11	Louisville, Ky.	16,846	4.56	2.84	.65	1.07									
	12	Memphis, Tenn.	14,201	4.64	2.58	.73	1.33									
	13	Mobile, Ala.	28,953	3.77	2.19	.61	.97									
	14	New Orleans, La.	129,786	2.73	1.63	.53	.57									
	15	Pittsburgh, Pa.	18,752	4.46	2.76	.67	1.03									
	16	Portland, Me.	16,397	3.53	1.95	.66	.92									
	17	Port Townsend, Wash.	33,371	3.29	1.87	.65	.77									
	18	St. Louis, Mo.	21,226	4.47	2.47	.56	1.44									
	19	San Francisco, Calif.	104,651	3.45	1.99	.68	.79									
	20	Savannah, Ga.	41,239	3.48	1.99	.62	.87									
	21	Stapleton, N. Y.	97,503	3.93	2.38	.55	1.00									
	22	Vineyard Haven, Mass.	8,540	3.68	1.88	.77	1.03									
	43	Ellis Island, N. Y.	116,043	4.03	1.91	.66	1.46									
	52	Norfolk, Va.	62,302	4.12	2.42	.68	1.02									
	Per diem cost for General Hospitals			3.74	2.13	.63	.98									
	Total Hospital Relief Days		956,702	Cost \$3,572,914.52												
Tuberculosis	9	Port Stanton, N. M.	82,669	3.22	1.26	.81	1.13									
					Cost \$ 265,088.19											
Leprosarium	66	Carville, La.	94,359	3.88	2.23	.58	1.07									
					Cost \$ 366,187.30											
All	Per diem cost for all Hospitals			3.71	2.08	.64	.99									
	Relief Days for all Hospitals		1,133,730	Total cost \$4,205,190.01												

NOTE.—This study is based on items of operating expenses of U. S. Marine Hospitals, after deducting miscellaneous income received from sales of rations and meals, grease and garbage, sales of occupational therapy articles, and sales of unserviceable property, which money is deposited as miscellaneous receipts, Treasury Department. The receipts for care of pay patients, aggregating \$495,990.92, is not deducted from operating expenses in calculating the per diem cost. Per diem cost for salary does not include commutation for quarters, subsistence, and laundry, which are included in "other expenses." The cost of food is that of the unprepared ration for patients only. "Other" includes all other expenses of operation, such as supplies, food for personnel, telephone, telegraph, burials, freight and express, water, gas, electricity, etc. Figures are not final and are subject to revision.



Twenty-three medical and dental officers were detailed for exclusive duty with the Coast Guard for duty aboard cruising cutters and at important shore stations, and 103 contract physicians furnished relief for the personnel at section bases and other units remote from the regular relief stations.

In addition to the medical and surgical supplies furnished as usual by the Public Health Service to cruising cutters and bases, five destroyers were medically equipped during the year, and the following first-aid and emergency supplies furnished to patrol boats and other Coast Guard units:

First-aid kits.....	432
Patrol-boat kits.....	197
Station medical kits.....	252

The expenditure for emergency relief incurred by the Coast Guard at civilian hospitals having no contracts with the Public Health Service, both in the United States and in foreign countries, is increasing.

#### UNITED STATES EMPLOYEES' COMPENSATION COMMISSION

Civil employees of the United States injured in line of duty continue to be one of the major classes of beneficiaries of the Public Health Service, which is the principal medical agent of the commission. The number of such patients treated increased 2.98 per cent over last year, and they called for 49,382 hospital days, 129,421 outpatient treatments, and 8,997 physical examinations. Nineteen out of every 100 of all patients treated at marine hospitals and other relief stations are beneficiaries of this class.

The 1925 annual report of the Employees' Compensation Commission makes in part the following comment on the medical services furnished by the Public Health Service:

Government hospitals and medical officers available to beneficiaries of the commission are, to the greatest extent, those of the Public Health Service. The hospitals of the War and Navy Departments may, under certain conditions when other facilities are not available, be used for the employees of other departments, but this relief is so exceptionally used as to be practically negligible, for the reason that these facilities are usually reported unavailable or impracticable except for emergency.

The present medical facilities of the Public Health Service available to the commission (September, 1925) include 25 hospitals, of which 23 are general hospitals, 1 for cases of tuberculosis, and 1 for leprosy. These hospitals are distributed along the coast and waterways; but as there are only two general hospitals west of the Mississippi River the lack of adequate Government medical facilities in this great district is a serious handicap to the commission.

Owing to the fact that the hospitals of the United States Veterans' Bureau are largely filled by beneficiaries of that bureau, there has been a very serious reduction in the number of claimants of the commission examined or treated under Government facilities. In exceptional cases it has been possible to obtain permission from the Director of the Veterans' Bureau to place certain individuals in the Veterans' Bureau hospitals whenever space for them is available. This permission, however, is not equivalent to the free and unrestricted use of this group of hospitals by the commission's beneficiaries. On the other hand, the commission has found that the hospitalization of industrial accident cases in close proximity to the residual Veterans' Bureau compensation claimants has frequently had an undesirable effect upon the attitude of the commission's beneficiaries in regard to compensation.

It is desired to emphasize the character of the service rendered by the United States marine hospitals. Both the hospital and dispensary services included

every medical facility which could be utilized with advantage in each case. Specialists have always been available whenever indicated, and a full staff of ophthalmologists, orthopedic surgeons, and neuropsychiatrists, with every facility for examination and diagnosis, were included on each hospital staff. Similar work done in civilian hospitals for the Government could have been obtained only at a great cost, but civilian hospitals or private physicians would not have had sufficient experience with compensation work to render as satisfactory reports of physical findings and examinations. In a review of the current year's cases treated at the marine hospitals as compared with claimants necessarily placed under the care of civilian hospitals, it is evident that services and facilities were rendered by Public Health Service which could not be procured at any price by the Government elsewhere, and that taking into consideration the departments for physiotherapy, hydrotherapy, and vocational therapy, that had a like service been procurable anywhere else it must necessarily have been at a prohibitive cost, and few, if any, civilian hospitals or physicians have been able to render in the first instance reports necessary and essential in the proper consideration of a claim from the compensation standpoint.

A conservative estimate of the value of these services would be for hospital cases \$3.50 per day for bed, board, and nursing, and \$3 a day for medical attention; for dispensary treatments, \$2.50 each; and for examinations from \$5 to \$10 each. This is less than the same service would cost outside Government institutions. On this conservative estimate the value of the medical service rendered for the fiscal year of 1924-25 by the United States Public Health Service to the Employees' Compensation Commission would approximate \$900,000.

#### LIGHTHOUSE SERVICE

The obligations of the Public Health Service to furnish medical relief to Lighthouse Service personnel were increased by the act of May 22, 1926. This act provides (1) for the procurement, in emergencies, by the personnel in question, of medical and hospital relief at other than relief stations of the Public Health Service, and (2) authorizes the furnishing of medical, surgical, and hospital supplies for use of officers and crews of vessels of the Lighthouse Service, which maintains 662 lighthouses, 59 lightships, and 55 lighthouse tenders, with a total personnel of 3,752 men. The estimates for funds for the fiscal year 1928 have been increased \$1,400 for emergency relief and \$1,200 for medical supplies for the Lighthouse Service.

#### INSTRUCTION AND EXAMINATION OF SHIPS' OFFICERS IN FIRST AID

Candidates for original licenses as master, mate, pilot, or engineer must, by a requirement in the regulations promulgated by the Steamboat Inspection Service, Department of Commerce, first pass a satisfactory examination in the principles of first aid before an officer of the Public Health Service. This regulation, which became operative July 1, 1922, was brought about by the necessity for intelligent first-aid treatment at sea on vessels having no medical officer. Many permanent injuries, and even deaths, among seamen have resulted through the lack of proper attention to minor injuries.

In order to assist these candidates and men already licensed, who frequently desire the instruction, the Public Health Service gives regular instruction courses in the principles of first aid at 43 designated marine hospitals and relief stations in ports where the local offices of steamboat inspectors are located. The courses, which are uniform, cover a series of lectures by a medical officer, extending over a period of three weeks. Candidates are instructed in the use and

application of commonly used remedies, the dressing of wounds, bandaging, resuscitation, the sanitation of vessels, and the transmission of requests by radio for medical advice. At the end of the instruction period the candidates are examined orally and the successful ones certified to the Steamboat Inspection Service as qualified. Those candidates who are unable to attend the lectures may study approved textbooks and apply for examination when they consider themselves proficient. An average of 1,702 candidates have been instructed each year since the inauguration of the work, and it will be only a matter of a few years until all licensed officers on vessels of the United States have acquired a knowledge of first aid.

#### FOREIGN SEAMEN

In accordance with a custom that has prevailed since March 3, 1875, seamen from foreign ships are admitted to any marine hospital or other relief station at the request of the consul or other responsible agent. The rates for treatment, which are fixed by the Secretary of the Treasury, were, during the last fiscal year, \$3.80 per day for hospital patients and \$1 per out-patient treatment. In response to requests that out-patient treatment be made available to foreign seamen, particularly for venereal disease and other maladies of a confidential nature, upon their application and without formalities, instructions were issued which enable a foreign seaman to obtain out-patient treatment at any marine hospital or other relief station at his own expense. All sums derived from the treatment of foreign seamen are deposited in miscellaneous receipts. These amounted to \$85,982.11 during the past fiscal year.

#### INTERNATIONAL CONFERENCE ON THE HEALTH OF MERCHANT SEAMEN

An International Conference for the Improvement in the Health of Merchant Seamen was held at Oslo, Norway, June 28, 1926, and reported by Senior Surg. Taliaferro Clark. The conference was opened by the King of Norway in person. It was sponsored by the International Red Cross and attended by representatives of all the principal maritime nations, who discussed at length the responsibilities for the care of sick and disabled merchant seamen of various countries and ways and means for providing dispensary and hospital care, particularly for seamen having venereal infection, tuberculosis, and other communicable diseases. A standard ship's medicine chest, a handbook of medical instruction, welfare agencies in various ports, and means whereby seamen might be apprised of treatment facilities were also considered. Progress was reported by various countries in the improvement of berthing and living conditions on merchant vessels, a subject that has long engaged the interest of the Public Health Service because of its intimate relation to the health of American seamen. An article by the Surgeon General of the United States Public Health Service bearing on this general subject was published in *The World's Health* for June, 1926.

#### CLINICAL WORK

It has not been possible to furnish all the personnel or equipment needed in all the marine hospitals. Many requests for relief were

disapproved because of doubtful eligibility, especially in instances where seamen had intermissions in sea duty. Inquiries have been received as to the feasibility of making permanent the eligibility of seamen who contributed from their sea pay to the marine hospital fund prior to the discontinuance of direct collections in 1884. This is a matter for the Congress to determine.

Practically all the marine hospitals have been found by the American College of Surgeons to comply with the standards promulgated by that organization. In the large hospitals weekly staff conferences are held, at which clinical matters are discussed and medical and scientific journals reviewed. The attending specialists, now aggregating 166 in number, serving the various marine hospitals assist in maintaining proper clinical standards.

There has been an increasing need for radium treatment, and, from a canvass, it was found available for service patients at all stations except Key West, Port Townsend, Vineyard Haven, and Carville at charges ranging from 5 cents per millicurie-hour in Baltimore, Md., to 20 cents per millicurie-hour in Savannah, Ga.

The number of necropsies has been increased. There were 699 deaths in the marine hospitals and 166 necropsies, or 23.7 per cent. A post-mortem examination is important to the medical staff, because it shows the actual conditions causing death. It is often of great importance to the relatives of the deceased, particularly where life insurance is involved and the claims of ex-service men are pending. It is also important in instances where injuries have been sustained and claims are pending for compensation. Some of the hospitals reporting the highest percentage of necropsies are the following:

Marine hospital	Deaths	Necropsies	Per cent
Fort Stanton, N. Mex.....	24	22	91.6
Carville, La.....	29	19	65.5
Chicago, Ill.....	35	20	57.1
Mobile, Ala.....	21	11	52.3
Buffalo, N. Y.....	17	8	47.0
Stapleton, N. Y.....	89	41	46.0
Savannah, Ga.....	23	10	43.4
New Orleans, La.....	45	11	24.4
Vineyard Haven, Mass.....	9	2	22.2
Baltimore, Md.....	43	7	16.2
St. Louis, Mo.....	14	2	14.2
Boston, Mass.....	38	4	10.5
Ellis Island, N. Y.....	67	5	7.4

Reference to table 5, p. 251, Causes of Death, will show the large number of deaths among service beneficiaries from violence or other external cause. Of 51 deaths so caused, 41 were due to accidental traumatism, such as falls, burns, by machines, etc. Only beneficiaries who are admitted to hospital before death are here listed.

*Consolidated clinical laboratory report, fiscal year 1926, United States marine hospitals and second-class stations*

Blood:

Complement fixation—

Syphilis.....	35,441
Gonorrhea.....	121
Tuberculosis.....	16
Erythrocyte counts.....	3,201
Leucocyte counts.....	5,545



## Blood—Continued.

Differential leucocyte counts.....	5,306
Malaria.....	2,139
Typing.....	511
Blood cultures.....	333
Chemical determinations—	
Carbon dioxide (Van Slyke or similar).....	68
Creatinine.....	120
Sugar.....	531
Urea nitrogen.....	195
Uric acid nitrogen.....	123
Total nitrogen.....	156
Hemoglobin.....	2,902
Coagulation time.....	1,159
Miscellaneous examinations.....	351

## Urine:

Urinalyses.....	59,319
Renal function tests.....	580
Quantitative sugar.....	2,203
Miscellaneous urine.....	726

## Feces:

Parasites and ova.....	5,182
Dysentery.....	703
Metabolic examination.....	65
Occult blood.....	1,285

## Sputum:

Tubercle bacillus.....	24,116
Pneumococcus.....	262
Other organisms.....	150

## Stomach or duodenal contents:

Routine.....	1,110
Special.....	148

## Spinal fluid:

Wassermann.....	573
Colloidal gold reaction.....	254
Globulin test.....	527
Cell count.....	568
Bacteriological examination.....	23
Other examinations.....	9

## Bacteriological examination:

Discharges—	
Urethral.....	20,403
Other.....	1,204
T. pallidum—	
Dark field.....	1,294
Smear.....	142
Smears, Bacillus lepra.....	772
Throat smears.....	1,332
Other miscellaneous.....	2,682
Cultures—	
Throat.....	767
Other.....	2,606
Bacteriological counts.....	46

## Typhoid and paratyphoid examinations:

Agglutination tests.....	371
Feces.....	420
Urine.....	281

## Water analysis:

Chemical.....	12
Bacteriological.....	105

## Milk analysis:

Chemical.....	77
Bacteriological.....	27

## Animal inoculations.....

858

## Pathological examinations:

Autopsies.....	154
Tissue examinations.....	2,316

Vaccines: Autogenous-----	54
Miscellaneous examinations otherwise unclassified-----	364
Total examinations-----	192, 308

*Consolidated annual X-ray report, fiscal year 1926, United States marine hospitals and second-class relief stations*

Number of patients examined-----	27, 300
Number of exposures made:	
Chest-----	4, 570
Bone and joint-----	18, 831
Dental-----	8, 718
Gastrointestinal and urogenital tracts-----	2, 779
Miscellaneous-----	2, 637
Total-----	37, 535

### DENTAL UNIT

There was a marked increase over previous years in the amount of work performed by the dental officers of this service, both in marine hospitals, where 30 full-time dentists are on duty, and at the other relief stations and small marine hospitals, where 33 contract dental surgeons are employed. The full-time dental officers furnished dental relief to 30,811 beneficiaries. The total number of treatments was 110,320, among the most important of which were 9,152 prophylactic treatments, 25,195 extractions, 4,534 X rays, 13,777 alloy fillings, 5,161 silicate cement fillings, and 4,211 prosthetic appliances. Splints were prepared for 69 fractures of the jaw. The entire amount of treatment was rendered at a total cost of \$140,317. It would have cost \$313,113 for the same amount of work if done by civilian dentists working on a fee basis. A dental officer was assigned to duty at the marine hospital, Ellis Island, to meet the increasing needs there, and new dental equipment was installed.

A bulletin is issued from the Bureau Dental Unit containing varied information for service dental officers and facilitating the exchange of ideas on problems relating to service dentistry. Dental Surg. (R) C. T. Messner is in general supervision of all dental field work and also in charge of the dental relief station at Washington, D. C.

### CONTRACT PHYSICIANS

To meet unusual conditions in supplying medical relief to Coast Guard shore stations (principally life-saving stations), lighthouses, and lightships, the work has been organized with headquarters at certain designated marine hospitals and relief stations in districts corresponding as far as possible with Coast Guard districts. It is necessary to maintain contracts with more than 100 physicians practicing in the neighborhood of groups of these beneficiaries, whereby they devote a portion of time to treatment which otherwise could not be supplied because of remoteness from regular service facilities. These physicians treated 4,101 service beneficiaries 10,702 times, made 1,307 physical examinations, and performed 2,292 vaccinations against smallpox and typhoid, at an aggregate cost of \$31,745. The accompanying table shows the general division of this work among

the various headquarters. The necessary administrative functions add considerably to the clerical work of the stations.

Administrative headquarters	Number of Coast Guard stations	Number of light-houses and light-ships	Number of contract physicians
Marine hospital:			
Portland, Me.....	16	33	8
Boston, Mass.....	31	49	9
Stapleton, N. Y.....	31	8	11
Baltimore, Md.....	10	23	2
Norfolk, Va.....	48	26	10
Savannah, Ga.....	10	5	3
Buffalo, N. Y.....	5	4	3
Cleveland, Ohio.....	6	10	3
Detroit, Mich.....	12	19	10
Chicago, Ill.....	20	29	11
San Francisco, Calif.....	8	3	1
Port Townsend, Wash.....	14	16	8
Relief station:			
Providence, R. I.....	12	15	3
Philadelphia, Pa.....	43	11	8
Galveston, Tex.....	10	11	4
Milwaukee, Wis.....	21	32	9
Total.....	297	294	103

### COSTS OF OUT-PATIENT RELIEF

The average cost of an out-patient treatment at marine hospitals and second-class relief stations is approximately 83 cents, excluding the cost of supplies. This low cost is due to the large number of minor injuries and conditions treated at stations where little dental relief or other special forms of treatment is rendered. Of the 94 relief stations of the third class only 25, the most active, are furnished with drugs and medical supplies. The average cost of these medicines and supplies was approximately 13 cents for each out-patient treatment.

### PHYSICAL EXAMINATIONS

As shown in Table 3, page 246, the total number of physical examinations for the various classes of beneficiaries was 91,553. These examinations are only those of which special written reports are made to comply with specific requests and do not include the physical examinations made in connection with the treatment of patients. The character of the various examinations made for principal classes of beneficiaries was as follows:

1. *General physical examination, including special tests for vision, color vision, and hearing.*—This examination, which is very complete, with the patient stripped, is given to seamen from both American and foreign vessels, to all Coast Guard recruits, and men referred from the Army and Navy, Lighthouse Service, and Coast and Geodetic Survey. The shipping act (Public, No. 302, approved March 5, 1915) provides that 65 per cent of all seamen on American vessels must be "able-bodied" seamen, hence the significance and importance of their physical examinations, which are designed to promote the safety of ships by insuring a proper number of physically competent seamen to meet emergencies. Of the 41,604 examinations of this

class, 10,241 applicants were rejected. The principal causes for rejection were defective vision, diseases of the heart, albuminuria, underweight, venereal disease, and insufficient teeth. The last-named disability is more and more frequently made a cause for rejection by shipowners critical in the selection of seamen.

2. *General examinations were made with special X-ray and other laboratory tests when indicated, frequently with the assistance of attending specialists, with or without a period of observation in hospital.*—This examination is made for patients of the Employees' Compensation Commission and United States Veterans' Bureau in connection with claims for compensation against the Government. It is minute and complicated and involves a large amount of clerical work in the preparation. Nine thousand three hundred eighty-two examinations of this character were made.

3. *Special tests of vision and color vision.*—This is an examination that all pilots, masters, mates, and other ship's officers must take to qualify for a license from the United States Steamboat Inspection Service. The tests are considered so important for the safety and proper navigation of ships that for many years all such candidates have been examined by the Public Health Service exclusively. Of 6,521 men examined during the year 220 were rejected. The most frequent cause for rejection was color blindness.

4. *General physical examinations to determine fitness for employment or for retirement by the Civil Service Commission.*—The provisions for retirement of Government employees, especially for physical defects (Public, No. 215, approved May 22, 1920), and for compensation for disability arising from employment (Public, No. 267, approved September 7, 1916), have made it necessary for the Government to require a physical examination designed to reveal existing defects that, although not necessarily excluding the applicant from employment, are made matters of record to protect the Government from unjust claims for compensation. The certificate formerly given perhaps after a perfunctory examination by the family doctor does not adequately fill the needs. A thorough examination also facilitates placement of employees having minor physical defects so as to minimize the hazards of employment. A large number of Government employees annually request and receive this physical examination as a precautionary measure to forestall the development of organic diseases. Those in need of treatment are referred to the family physician.

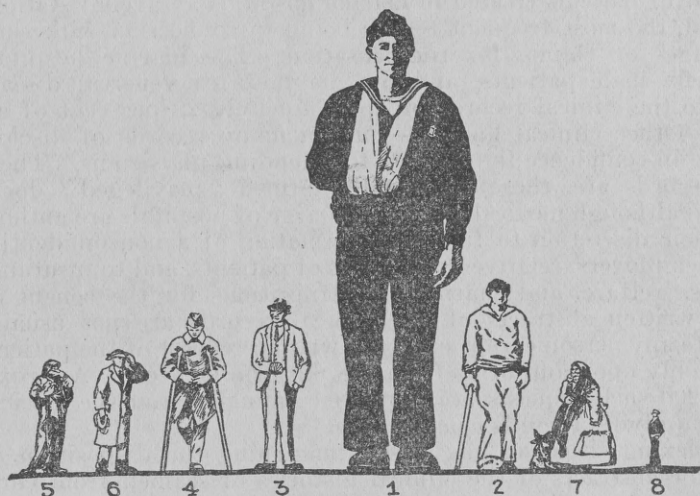
5. *Special examinations to determine the presence of contagious diseases.*—Food handlers on passenger-carrying vessels engaged in interstate trade are required to be free from conditions whereby they might convey infection. "Carriers" of typhoid are detected by bacteriological tests, and less obscure diseases by more direct methods. Persons employed by the Government and suspected of having tuberculosis or other communicable disease in a form endangering the health of others are also sent to the Public Health Service for examination.

6. *Eligibility for pension.*—The Bureau of Pensions is making an increased use of the service facilities at marine hospitals and other regularly established relief stations, thus eliminating its expense for examinations by special pension boards. The examination of this class has increased from 44 in 1925 to 821 in 1926.



FIG. 3

# PATIENTS OF U.S. PUBLIC HEALTH SERVICE IN MARINE HOSPITALS AND RELIEF STATIONS FISCAL YEAR 1926



Relative Amount of Medical Service Furnished on the Basis of 100  
for Merchant Seamen

1. Merchant Seamen 100
2. U. S. Coast Guard 14.83
3. U. S. Employees Compensation Commission 11.61
4. U. S. Veterans Bureau Patients 9.13
5. Lepers 8.58
6. Miscellaneous Non-Nautical 7.16
7. Immigration 5.73
8. Miscellaneous Nautical 1.66

## RADIO MEDICAL ADVICE TO SHIPS AT SEA

Requests for medical advice by radio from ships at sea increased during the year. This service is well known in shipping channels and requests are received from both American and foreign vessels. Messages are given the right of way and handled free of charge by governmental and commercial radio stations. Marine hospitals and relief stations at the following ports have participated in this work: New York City; Key West, Fla.; New Orleans, La.; San Francisco, Calif.; Chicago, Ill.; Cleveland, Ohio; Sault Ste Marie, Mich.; Manila, P. I.; Galveston, Tex.; and Honolulu, Hawaii.

## CLINICAL INFORMATION

A very large number of requests for information from the clinical records of patients treated in marine hospitals and relief stations is received, the most frequent reason being in connection with suits for damages or claims for compensation. The marine hospitals treat chiefly male patients, and the diagnosis of venereal disease enters into the clinical records of approximately 22 per cent of all patients. Other clinical histories contain many records of disclosures made in confidence by patients to attending physicians. These clinical records are, therefore, legally termed "privileged" documents, and although medical officers in charge of hospitals are authorized at their discretion to furnish information of a nonconfidential nature to employers, relatives, or friends of patients, and to insurance companies, welfare, and charitable organizations for the benefit of patients, written abstracts of the clinical records are not usually supplied to any person except upon the written request of the patient, and then only upon authority from the Surgeon General. Approximately 1,200 such requests are approved annually, and the clerical work of supplying these is considerable.

A perplexing situation has arisen concerning the disposition of requests for abstracts of the clinical histories of seamen from Government-owned vessels, particularly those belonging to the United States Shipping Board. The question has arisen as to whether the rights of the seamen are paramount to those of the Government, and whether the latter may use for its purposes the information available in its own files regardless of the patient's consent. The service has been guided in this matter entirely by the opinions rendered by the Solicitor of the Treasury and the Attorney General. Aliens detained in hospital at Ellis Island at the request of the Bureau of Immigration are not furnished with abstracts from their clinical records except upon a court order. Patients of the Employees' Compensation Commission, i. e., civil employees of the Federal Government disabled as the result of employment, are not supplied with abstracts except when authorized by the Commission or by court order.

## DISPOSITION OF SURPLUS PROPERTY

Executive order of April 29, 1922, transferred to the United States Veterans' Bureau 47 active hospitals at that time being operated by the Public Health Service for the care of World War veterans, and directed the division of surplus medical and hospital supplies

and equipment on hand of which, by agreement, the service took 20 per cent. A portion of this surplus property was excess to service needs and was disposed of to prevent deterioration.

For the best interests of the Government, the property was distributed chiefly to other governmental establishments through the coordinator and only a very small portion sold at auction. The service solicited the various governmental establishments known to have need for the type of property on hand and was able to effect the transfer thereto of property having an inventory value of \$456,006.27, or more than 70 per cent of its excess. It was necessary to sell at auction only \$30,834.01 worth of property, consisting of drugs and chemicals not used extensively in peace times, or unfit for hospital use, at least until reprocessed. Property having an inventory value of \$118,951.12 was sold to State and charitable institutions. The total value of surplus property disposed of to date is \$605,791.40. With the exception of a few items, some of which are now in process of transfer to other governmental agencies, the service has disposed of all property surplus to its needs, as shown below:

Transferred to—	Inventory value of property
Agriculture, Department of..... Electrical and plumbing supplies, automobile spare parts, drugs and chemicals, laboratory glassware, cotton duck, tents, kitchen and mess equipment for the Forest Service, Bureau of Public Roads, Bureau of Animal Industry, Bureau of Plant Industry, Bureau of Dairying, and Bureau of Entomology.	\$95,015.24
American National Red Cross..... Woolen helmets and wristlets originally donated by the Red Cross.	3,332.40
Commerce, Department of..... Medicines, surgical instruments, beds, mattresses, blankets, and first-aid dressing packets for the Bureau of Fisheries, Mines, Standards, Lighthouse, and the Coast and Geodetic Survey.	5,043.43
Commissioners, District of Columbia..... Hardware and plumbing supplies for the water and sewer departments.	11,609.65
Government Printing Office..... Drugs, medical supplies, surgical instruments, and bottles for use in the dispensary maintained in the Government Printing Office.	5,507.14
Interior, Department of..... Hospital supplies and equipment, hardware and mechanical equipment, drugs and chemicals, laboratory and dispensary supplies, surgical instruments and appliances, dental supplies, kitchen supplies and equipment for the Bureau of Mines, Freedmen's Hospital, Geological Survey, Howard University, Office of Indian Affairs, and National Park Service, including the hospital at Yellowstone National Park.	180,938.87
Justice, Department of..... Drugs, surgical instruments and appliances, bandages, laboratory glassware and equipment, dispensary supplies, beds and mattresses, small hardware and mechanical equipment for the Federal penitentiaries at Leavenworth, Kans.; McNeil Island, Calif.; Atlanta, Ga.; and the United States marshal, Valdez, Alaska.	27,238.53
Labor, Department of..... Hospital beds for the Immigration Service at El Paso, Tex.	83.25
National Home for Disabled Volunteer Soldiers..... Drugs and chemicals, surgical instruments and appliances, kitchen supplies, laboratory, dispensary, and dental supplies for the homes at Danville, Ill., Dayton, Ohio, Hampton, Va., Hot Springs, S. Dak., Johnson City, Tenn., Milwaukee, Wis., Santa Monica, Calif., and Togus, Me.	38,426.29
National Training School for Boys, Washington, D. C..... Surgical instruments.	5.61
Navy Department..... Medical supplies, surgical instruments, and mess equipment.	2,789.17
Personnel Classification Board..... First-aid supplies.	.22
Post Office Department..... Drugs, medical and surgical supplies, appliances, etc., wheel chairs, mattresses, and blankets for emergency use in the larger post offices.	22,492.91
Public buildings and public parks of the National Capital..... Drugs, surgical instruments, and other dispensary supplies, small hardware, cotton duck, gas-mask fabric, and certain other textiles.	25,280.96
Shipping Board..... Cotton duck.	2,450.87
Smithsonian Institution..... Small hardware, plumbing and electrical supplies, and kitchen equipment for use of the National Museum and the National Zoological Park.	3,973.76

Transferred to	Inventory value of property
Treasury Department..... Drugs and chemicals, surgical supplies, office supplies and equipment, small hardware, plumbing and electrical supplies, as well as emergency relief material for first-aid use for the United States Coast Guard, Bureau of Internal Revenue, Bureau of Printing and Engraving, and the chief clerk's office.	\$19,269.33
War Department..... Yarn, coffee urns, burlap bags, and a wood-carving machine.	12,548.64
Total.....	456,006.27
<i>Sales</i>	
To State and charitable institutions.....	118,951.12
At auction.....	30,834.01
Grand total.....	\$605,791.40

## CONSTRUCTION AND REPAIR

During the year no important new construction was begun. Legislation was enacted, however (Public, No. 244, 69th Cong., H. R. 9875, approved May 18, 1926), whereby Windmill Point was obtained from the Lighthouse Service as a site for the proposed new marine hospital in Detroit. The new location is ideal, situated on the water front at the entrance to the straits just above Belle Isle. A limit of cost for this hospital was fixed by the Congress at \$600,000. (Public, No. 492, 69th Cong., H. R. 13040, second deficiency bill, approved July 3, 1926.)

The appropriations for new quarters for medical officers, pharmacists, nurses, and attendants at the Chicago marine hospital were increased to \$233,000, and an additional sum of \$184,000 was appropriated for extension to power house, the modernization of mechanical equipment, additional facilities, and general repairs. The inadequate funds available for the construction of doctor's quarters at the Savannah marine hospital were also augmented by an additional \$8,000, all by the act last above referred to.

At Baltimore the hospital heating system was remodeled and the sewerage system was connected with the city sewer. At Boston a building was remodeled to provide additional housing facilities for personnel and a fire pump was installed. At Fort Stanton the dental office, X-ray laboratory, and library were rehoused in building No. 8, completely remodeled for the purpose. At Memphis additional bathing facilities were provided in all wards and the junior medical officers' quarters were enlarged. At New Orleans steam heat was extended to one large ward and a small frame isolation unit was constructed. At Portland, Me., new lighting fixtures were installed throughout, verandas on second and third floors were glassed in, toilet facilities were increased, male attendants' quarters were remodeled, and a nurses' call system was installed. It is also planned to increase the ward space there by remodeling the main hospital building.

At Stapleton a small addition was built to the junior medical officers' quarters and an electrical mortuary refrigerator was installed in the hospital basement. At Savannah two verandas were glassed in, and a third veranda was converted into a three-bed ward



and private room. At St. Louis a new heating system was installed. At San Francisco new roofs were installed on four buildings, and ward No. 7 was altered and remodeled to provide for the installation of new X-ray equipment. At the National Leper Home at Carville, La., a new dairy barn was constructed, new electric-power lines were laid from the power house to the physiotherapy building and dairy, and the interior of 37 buildings and exterior of 20 buildings were painted by the station force. The grounds at Baltimore, Boston, Buffalo, Fort Stanton, Louisville, Memphis, Pittsburgh, St. Louis, and Carville were beautified by the addition of shrubs and trees secured in many instances without expense to the Government.

The present major needs of the various hospitals are summarized as follows:

*New Orleans and San Francisco.*—Extensive new construction, especially to replace old frame structures with fireproof wards, to modernize and enlarge each hospital to a capacity of 500 beds.

*Carville.*—An infirmary building, detention facilities, and a recreation building.

*Stapleton.*—Replacement of temporary frame surgical unit and enlargement of the hospital to 500 beds.

*Baltimore.*—Fireproof buildings to replace old frame wards, additional nurses' quarters, and enlarged patients' dining room and kitchen.

*Buffalo.*—Extension of ward space to enlarge the hospital to 100 beds, and quarters for nurses and officers.

*Fort Stanton.*—A modern surgical unit and infirmary building, and additional quarters for personnel.

*Pittsburgh and Portland.*—Quarters for nurses, medical officers, and attendants.

*Mobile.*—A 50-bed extension to the hospital and a nurses' home.

*St. Louis.*—A modern 50-bed ward to replace old frame structures.

*Evansville.*—Nurses' quarters and a surgical operating room.

*Seattle, Wash., and Galveston, Tex.*—New marine hospitals.

Inspection Engineer D. C. Trott, detailed from the office of the Supervising Architect, is in charge of construction and repair work.

#### ABSTRACTS OF FIELD REPORTS

A tabulated statement of the medical services given at marine hospitals and other relief stations is found on page 243. The briefest summary possible is given below of the detailed annual reports received from all stations.

*Marine Hospital No. 1, Baltimore, Md.*—Surg. M. H. Foster in charge. The bed capacity of this hospital, 167, was fully utilized, especially during the winter and early spring, when beds were erected in the smoking rooms and all other available places to provide the facilities required. The number of admissions increased last year by about 10 per cent, although the number of hospital days was not increased. Intravenous injections of the arsenicals for the treatment of syphilis numbered 2,184, and there were 6,059 surgical operations performed, the resident staff being assisted when necessary by local attending specialists. The transactions of the out-patient office increased, the number of treatments exceeding

that for the preceding year by 4,000, and the physical examinations by 800. A nurses' call-bell system was installed in the hospital.

*Marine Hospital No. 2, Boston (Chelsea), Mass.*—Senior Surg. J. O. Cobb in charge. The character of the principal classes of patients admitted to this hospital during the year was as follows: Merchant seamen, 888; foreign seamen, 63; Coast Guard men, 294; Employees' Compensation Commission, 61. The total number of patients treated was practically the same as last year. This hospital is particularly well equipped for handling patients of the Employees' Compensation Commission, as it possesses facilities for the care of both male and female patients.

*Marine Hospital No. 3, Buffalo, N. Y.*—Surg. J. W. Trask in charge. This hospital, with a rated capacity of 60 beds, had a daily average of 61.8 patients during the year, additional beds being placed in the wards, on the porches, and in the corridors. The average duration of stay of patients was 30.02 days. There were performed 3,731 surgical operations, of which 215 were major. There were 980 dental treatments for inpatients and 3,338 dental treatments for out-patients. Owing to the almost constantly overcrowded condition of this hospital, which is utilized extensively by the United States Veterans' Bureau, as well as by the Employees' Compensation Commission, it is evident that it should be enlarged by the construction of an additional wing. The Veterans' Bureau has recently requested that between 60 and 75 beds be made available for its patients when practicable. All patients except those acutely ill have been eliminated, admission being secured in many instances to the Sailors' Snug Harbor on Staten Island, New York City, or to soldiers' homes or other institutions furnishing domiciliary care.

*Marine Hospital No. 5, Chicago, Ill.*—Surg. R. M. Grimm in charge. As heretofore, this hospital, like other marine hospitals, has been conducted as a general medical and surgical hospital, with a ward for tuberculosis and one or two wards for venereal diseases. The surgical service was active, a large number of surgical operations being performed and 9,514 postsurgical dressings applied. The dentist furnished 2,039 dental treatments to hospital patients and out-patients. The acute character of the service in this hospital may be seen from the fact that 16,106 trays were served to bed patients. The physiotherapy department was operated by two aides, working under the supervision of a medical officer; new equipment was added and a total of 11,093 treatments given, of which 7,603 were for hospital patients and 3,490 for out-patients. The clinical laboratory, conducted under the immediate supervision of a medical officer, made 5,712 examinations, including Wassermann, blood chemistry, and minor routine work. In the X-ray department 2,169 exposures were made for 1,366 patients. The American Medical Association has placed this hospital on the list of institutions approved for the training of internes.

Out-patient offices are located, respectively, at 563 Lake Shore Drive, Federal Building, Van Buren Street post office, and the hospital proper. The number of physical examinations has increased, largely because of Coast Guard recruiting and the new requirement for food handlers on Lake vessels. The hospital also provides office and administrative facilities for the medical director of the third district and the district engineer. Important new construction and

major repairs, authorized by recent legislation, are discussed on page 224.

*Marine Hospital No. 6, Cleveland, Ohio.*—Surg. L. P. H. Bahrenburg in charge. This hospital operated this year, as last, practically at capacity, and there was no increase possible in the number of patients, except in the out-patient office, where the work increased approximately 9 per cent, due in part, presumably, to the improved facilities in its new location in the United States Parcel Post Building, which is nearer the docks than the former location. There was, however, a marked increase in the amount of surgery performed, 19.36 per cent over last year and 114.5 per cent since 1923. There was an increase in laboratory procedures of 53 per cent over last year. The acquisition of a site for the new marine hospital is progressing satisfactorily, and it is believed that new construction will shortly be initiated.

*Marine Hospital No. 7, Detroit, Mich.*—Surg. J. S. Boggess in charge. A complete canvass of all hospital facilities available in Detroit shows that it is impossible to secure beds in contract institutions for the care of beneficiaries of the service during the erection of the new marine hospital proposed for this port. It will therefore be necessary to continue the present marine hospital in use as long as possible, or at least until construction is well underway. The Director of the United States Veterans' Bureau has asked that the capacity of this new hospital be such as to accommodate from 50 to 60 of his patients who, because of the numbers of seamen beneficiaries, are now not always able to obtain admission. The proposed capacity of the hospital has therefore been increased to meet the requirements of the Veterans' Bureau.

The hospital was almost constantly filled to capacity and patients of the Veterans' Bureau constituted approximately one-third of the hospital clientele. There was a large number of surgical operations, of which attending specialists performed a considerable proportion. Physiotherapy treatments numbering 14,843 were given, a large amount of this work being devoted to out-patients of the United States Veterans' Bureau.

*Marine Hospital No. 8, Evansville, Ind.*—Surg. Carl Ramus in charge. This is a small, general hospital with tuberculosis wards. Approximately one-half of the clientele are patients of the United States Veterans' Bureau, many of whom are admitted for a period of observation for diagnosis. The Employees' Compensation Commission also utilizes this institution freely for the care and examination of injured Federal employees. More than 1,000 examinations in connection with the care of patients and diagnosis of conditions were made in the clinical laboratory of the hospital.

*Marine Hospital No. 9, Fort Stanton, N. Mex.*—Surg. J. W. Tappan in charge. This sanatorium, reserved exclusively for tuberculosis patients, is excellently located for the purpose in the south central part of New Mexico. The summers are never oppressively hot, and the winters, with sunny days, low humidity, and clear cold air, are ideal. It is situated at an altitude of 6,230 feet above sea level, at a latitude approximating that of San Diego, Calif. Considerable care is exercised in the selection of patients, and only those who are ambulatory and otherwise meet the requirements of hospital

division circular No. 218, July 12, 1922, are transferred there. The rated capacity is 236 patients.

Direct solar therapy was continued in use on 37 patients, chiefly those having involvement of the bones, joints, and superficial tissues. The gradual exposure method of Rollier was used, a canvas sun shade being adjusted to allow partial exposure. All cases of bone, joint, and glandular tuberculosis showed improvement, and generally favorable results were obtained in the other cases selected for this treatment, which is not, however, considered specific nor of more than auxiliary therapeutic aid. Artificial heliotherapy was used extensively, 1,575 exposures to the various lamps being made. The importance of the eye, ear, nose, and throat department is evidenced by 3,271 throat treatments, not including heliotherapy treatments for tuberculous larynx, 779 special treatments of the eye, and 1,037 of the nose. Artificial pneumothorax was administered to 10 patients, 8 of whom had complete compression and 2 partial; 232 fillings were given. The routine work performed by the dental officer, exclusive of formal operations, dentures, and miscellaneous procedures, is tabulated below:

Number of new patients.....	196
Number of sittings.....	2,290
Hours operated.....	1,592
Prophylactic and other treatments (hours).....	707
Alloy fillings and restorations.....	721
Silicate cement fillings.....	101

One hundred seventeen patients were treated by occupational therapy, and the practice was continued of furnishing light employment to convalescent patients to test improvement and prepare for discharge. Twenty-six were so employed during the month of June. Considerable time and attention were devoted to diversion and recreation as therapeutic measures. A radio outfit with individual receiving sets was installed in the infirmary wards and loud speakers were supplied to recreation rooms, thus affording diversion, particularly for patients confined to bed and unable to attend the moving pictures which are shown twice weekly. Two chaplains, Catholic and Protestant, respectively, have been on duty during the year. The Y. M. C. A. and Knights of Columbus maintain their secretaries at the station, and the latter organization finances, without expense to the Government, the moving-picture shows. The Seamen's Church Institute has continued its secretary on duty and contributed generously to welfare work.

The station was supplied from its own resources with all milk and beef used at the station, approximately one-third of all the eggs consumed, and all pork products, including cured hams, and bacon. In addition, hides to the value of \$818.25 and livestock to the value of \$8,475 were disposed of by public auction. One hundred twenty-one beef and dairy animals, valued at \$7,180, were transferred to the National Leper Home, Carville, La. The number of cattle on hand at Fort Stanton at the end of the fiscal year was 1,100.

*Marine Hospital No. 10, Key West, Fla.*—Surg. M. K. Gwyn in charge. Reflecting the increase in shipping that has occurred in practically all our southern ports, the functions of this hospital have been considerably increased. The number of in-patients more than doubled between 1923 and 1926. There was at the same time a



decrease in the per diem cost, which in this small hospital varies considerably with the number of patients under treatment. The Naval Hospital at this port was closed during the last fiscal year, and naval patients requiring hospital care are, at the request of the Navy Department, admitted to this marine hospital. Officers and men from the Army are likewise admitted upon request, the military hospital also being closed.

*Marine Hospital No. 11, Louisville, Ky.*—Surg. E. H. Mullan in charge. This hospital was well filled during the year, 80.9 per cent of all patients being patients of the United States Veterans' Bureau. The staff of attending specialists, representing surgery, internal medicine, orthopedic surgery, neurology, neuropsychiatry, and eye, ear, nose, and throat, are freely utilized. This hospital also has an attending specialist in special laboratory procedure, whose services are utilized in the performance of important autopsies and other complicated laboratory procedures. To promote economies, the acting chief nurse performed the duties of dietitian, and, instead of a full-time technician, a clinical laboratorian has been employed at 75 cents per hour from three to five hours daily. Difficult and complicated X-ray procedures are performed by contract, the hospital itself performing all routine work.

*Marine Hospital No. 12, Memphis, Tenn.*—Surg. R. E. Ebersole in charge. This hospital, which was constructed in 1884, is ideally located on grounds beautified with shrubbery and trees, overlooking a broad sweep of the Mississippi River. While small, chiefly of frame construction, and lacking a suitably located operating room and other modern appointments, it has satisfactorily supplied the needs of the port, which, because of an increase in river shipping, have been considerable, necessitating the placing of beds on porches several times during the year to accommodate the clientele. No patients of the United States Veterans' Bureau are treated here, the majority being seamen from river craft and patients of the Employees' Compensation Commission. There has been a marked increase in the number of physical examinations of civil service appointees, civilians for Army training camps, and employees of various local Government activities.

*Marine Hospital No. 13, Mobile, Ala.*—Surg. W. H. Slaughter in charge. Demands for relief continue in excess of the facilities. Overflow patients are treated either in the City Hospital, Mobile, by contract, or are transferred to other marine hospitals having vacant beds.

There are three private rooms with individual baths for female patients or others requiring special care, and total facilities for 90 patients, usually apportioned, approximately, as follows:

Medical .....	30
Surgical .....	20
Urological .....	20
Eye, ear, nose, and throat .....	10
Infectious .....	5
Tuberculous .....	5
Total .....	90

A total of 1,718 surgical operations were performed, and 1,639 dental sittings given. The clinical laboratory is well equipped and manned with a full-time laboratorian, working under the direction

of a medical officer. The X-ray laboratory was enlarged and remodeled and modern equipment installed. The physiotherapy treatments continued to increase, a total of 6,683 being given to both hospital patients and out-patients. The out-patient office is located down town, conveniently near the shipping district.

*Marine Hospital No. 14, New Orleans, La.*—Surg. W. C. Rucker in charge. This hospital has continued to function far in excess of its rated capacity throughout the year, 129,786 days' relief being given, of which 100,762 were furnished merchant seamen. The average daily census was 355.5, with peaks of 409 and valleys of 302. Old-line beneficiaries constituted over 93 per cent of patients. Overcrowding of patients on porches and in shelters never intended for human occupation has of necessity been continued. From stand-points of humanity and true economy it is imperative that this hospital, which is wholly unfitted to meet the requirements of a great and growing port like New Orleans, be replaced by a suitable and modern fire-resisting structure. At present it is almost wholly of wooden construction; many of the wards are heated by stoves; the fire hazard is very great; the power and heating plant is wholly inadequate; there is no refrigeration plant; and the layout of the hospital makes economical administration exceedingly difficult.

The work of instructing junior officers in their professional and administrative duties has continued throughout the year, and from a small beginning in January, 1925, has now assumed the proportions of an officers' training school. While this has entailed much extra labor on the part of the medical officer in charge and his staff, the results have adequately repaid the effort. This was done without additional expense to the Government. Fifty-two staff meetings were held during the year. Of these, 12 were administrative, 12 clinical, and 28 literary.

The following is a summary of the operations of the various departments: Surgical—911 patients treated, 186 major and 271 minor operations performed; medical—781 patients treated; tuberculosis—69 patients treated; receiving—2,173 white and 528 colored; total of 2,701 patients admitted; urological, 1,383 patients treated; 2,592 doses of salvarsan administered; 780 operations performed, including 67 cystoscopies and 61 spinal punctures; 3,596 bloods drawn for Wassermann reactions; 5,176 prostatic smears were made; eye, ear, nose, and throat—233 operations performed, 9,705 treatments given, and 118 refractions made; dental—15,349 sittings, 17,255 treatments, and 2,243 completed cases; laboratory—27,657 examinations, 46 anti-tetanic and typhoid vaccinations; radiological—3,247 exposures on 1,957 patients; physiotherapy—21,128 treatments to 418 patients; consultant—1,107 consultations; out-patient—2,446 patients treated 4,689 times, 835 operations performed; dietary service—184,111 rations prepared and served. Physical examinations (other than examinations for treatment) were made of 6,152 persons, 4,121 by the hospital staff and 2,031 by the out-patient office.

Many economies were effected during the year. Among these was the manufacture of 15,104 pounds of soft soap made by the matériel department from fats which would otherwise have been wasted. Careful surveys of diets and wastes have resulted in many savings. Per diem and ration costs have been maintained at the low rate of the previous year.

*Marine Hospital No. 15, Pittsburgh, Pa.*—Senior Surg. C. H. Gardner in charge. There was an increase of 22½ per cent in the number of patients but a decrease of 1 per cent in the number of hospital days, a condition noted at other marine hospitals and due to causes previously discussed. Patients of the United States Veterans' Bureau constitute 72.6 per cent of the clientele of this hospital. The physiotherapy department of this hospital was enlarged and additional equipment was installed; 8,677 treatments were given. The out-patient office was moved from the hospital to the Federal Building, and its equipment and space were improved. A nurse employed by the Post Office Department devotes a portion of her time to the cooperative functions in this office. A large proportion of out-patient work is devoted to physical examinations of applicants for appointment in the civil service and for enlistment in the Coast Guard.

*Marine Hospital No. 16, Portland, Me.*—Surg. G. Parcher in charge. A phenomenal increase in work occurred at this station, the number of patients increasing 63.5 per cent and the total days' relief almost 100 per cent. This was due chiefly to the increased use of the hospital by the United States Veterans' Bureau. There was a corresponding increase in the amount of surgery performed and in the clinical laboratory and X-ray work. A physiotherapy department was opened, with a trained aid in charge. Welfare activities of the hospital were conducted by the American Red Cross and various other organizations, including Legion posts and auxiliaries, Veterans of Foreign Wars, Knights of Columbus, and the Junior League, which provided entertainments and in various ways supplied comfort and cheer to the patients.

*Marine Hospital No. 17, Port Townsend, Wash.*—Surg. F. H. McKeon in charge. This hospital is a wooden structure, built in 1895, when Port Townsend was an important port of entry in the Pacific Northwest. There was an increase in the volume of medical relief furnished during the year, although it is handicapped by its remoteness from the ports, principally Seattle, which it serves. The hospital was practically always filled to its capacity of 100, and, in addition, it was necessary to maintain approximately 20 patients in contract hospitals in Port Townsend and Seattle. Efforts were fruitful in making suitable disposition of a number of chronic cases, thereby relinquishing more beds for patients having acute diseases.

*Marine Hospital No. 18, St. Louis, Mo.*—Surg. A. J. McLaughlin in charge. The increase during recent years of the work at this hospital, particularly for seamen and patients of the Employees' Compensation Commission, is shown in the following table:

Year	Total patients treated	Hospital-patient days	Out-patient treatments	Physical examinations
1923.....	1,003	18,206	2,051	503
1924.....	1,420	20,506	4,099	910
1925.....	1,306	20,757	3,778	1,154
1926.....	1,186	21,226	4,922	1,007

There was a corresponding increase in the amount of surgery and special treatments. The physiotherapy department furnished 5,587 treatments, of which 3,308 were for in-patients and 2,279 for out-patients. This hospital had the experience of a large increase in

the number of patients without a corresponding increase in the number of hospital days, the turnover being increased by a reduction in the average duration of treatment.

*Marine Hospital No. 19, San Francisco, Calif.*—Senior Surg. W. J. Pettus in charge. This hospital, which is too small for the purpose, and the inflammable wards of which should be replaced with more commodious fireproof structures, was kept constantly filled. No increase in the hospital work proper can occur until the institution is enlarged. There were 4,998 intravenous injections of arsphenamine and kindred drugs. In the dental department there were 2,844 extractions alone. The X-ray department made 5,441 exposures, and the clinical laboratory 8,925 examinations. The physiotherapy department gave 45,436 treatments to 8,448 patients, as follows:

Nature of treatment	Number treated	Number treatments
Massage.....	2,479	13,985
Electrotherapy.....	1,853	11,840
Hydrotherapy.....	684	2,889
Thermotherapy.....	2,593	12,453
Exercise.....	839	4,269
Total.....	3,448	45,436

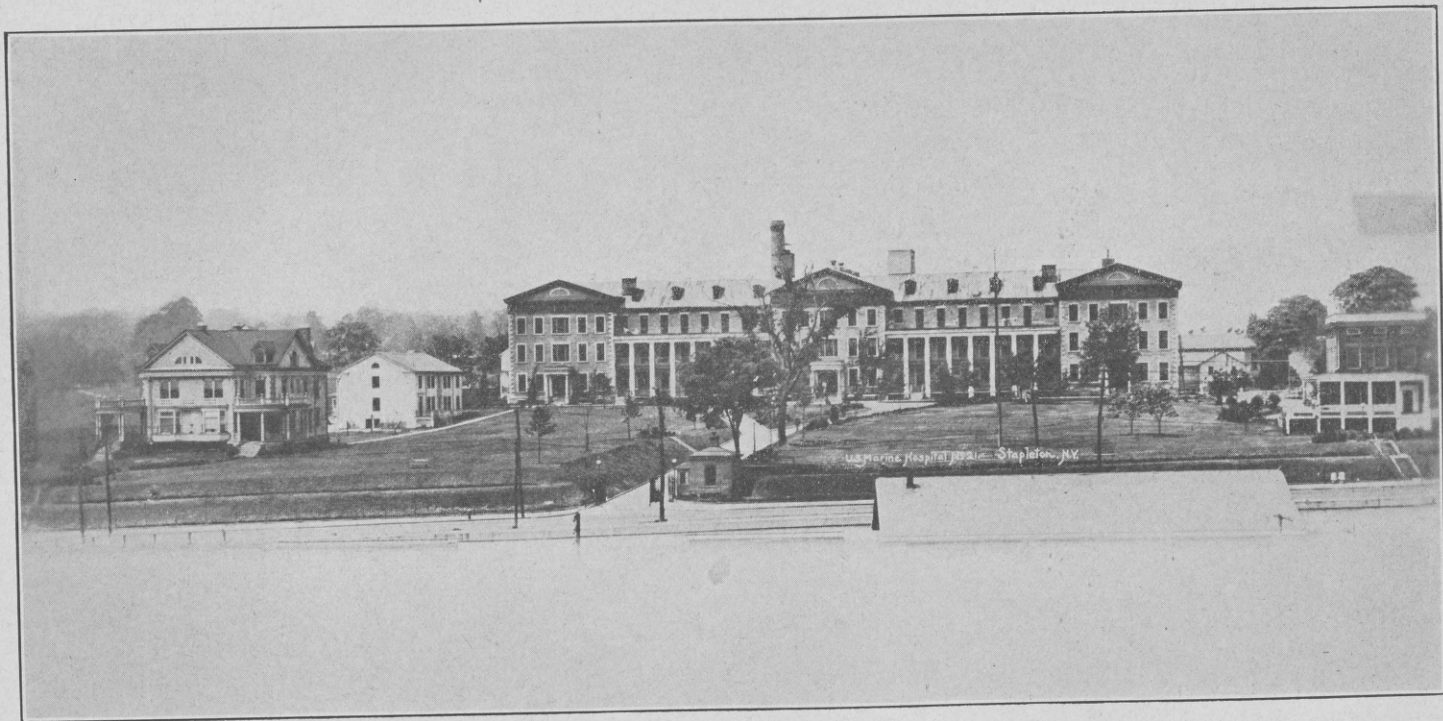
The out-patient work was practically doubled. The Seamen's Church Institute was active in the welfare activities. An average of 30 men a month, chiefly those rejoining ships after illness, are provided with clothing. Last year 25 patients were sent to the Sailors' Snug Harbor, Staten Island, an institution devoted to the care of veteran seamen who require chiefly custodial care. The Knights of Columbus and various other organizations continue to distribute cigarettes, toilet articles, etc., for the comfort of all patients.

*Marine Hospital No. 20, Savannah, Ga.*—Surg. J. W. Burkhalter in charge. This hospital, of fireproof construction, three and one-half stories high, was built in 1906, the capacity being increased to 146 patients by the addition of a new wing in 1924. A physiotherapy section was installed and 5,176 treatments given during the past year; 1,458 surgical operations were performed, and 3,846 dental treatments given. Well-equipped clinical and X-ray laboratories are maintained with part-time specialists in charge of each. The cafeteria system of serving meals was instituted with satisfactory results. The out-patient office is located in the hospital building.

*Marine Hospital No. 21, Stapleton, Staten Island, N. Y.*—Senior Surg. C. H. Lavinder in charge. This hospital was filled as usual to capacity, its overflow sometimes amounting to 200 patients being sent to the marine hospital at Ellis Island. Of a total of 3,470 hospital patients, 2,630 were merchant seamen from American vessels, 479 Coast Guard men, and 147 patients of the Employees Compensation Commission; the remainder belonged to various minor classes of beneficiaries. No increase in the number of patients was possible, but the equipment and appointments were somewhat improved and the hospital standards well maintained. The total number of hospital employees, including the medical officers, is 197, which allows only one for each 1.46 patients, or approximately one-half the average personnel employed in New York City in civilian hospitals.

The out-patient office, pharmacy, and executive office have been relocated to improve the administration. The facilities for housing





U. S. Marine Hospital No. 21, Stapleton, N. Y.



U. S. Marine Hospital No. 43, Ellis Island, N. Y.

personnel are unsatisfactory; surgical ward buildings of temporary construction and inflammable type should be replaced with fireproof buildings, and the hospital should be enlarged to 500 beds. The medical officer in charge believes that in undermanned hospitals standards may deteriorate almost imperceptibly under certain conditions and that the per diem cost, \$3.93, is lower than is compatible with continued efficiency. He recommends that the personnel be augmented, and believes that \$4.50 per day is not an excessive cost for the proper care of patients in this hospital. The following is a statistical summary of the transactions:

Bed capacity	288
Medical staff:	
Full time	12
Part time	2
Attending specialists, serving also Marine Hospitals Nos. 43 and 70	10
Dental staff, full time	2
Total personnel, exclusive of medical staff	181
Admissions	3, 224
Brought over from last year	246
	3, 470
Deaths	89
Autopsies	41
Number of hospital days	97, 507
Average length of stay in hospital, days	28.1
Average per diem cost	\$3. 93
Average cost of ration	\$0. 545
Operating expenses, total	\$388, 367. 93
Surgical operations performed	1, 603
Arsphenamine injections given	2, 001
Physiotherapy treatments given	34, 564
X-ray exposures made	8, 051
Laboratory examinations made	15, 877
Dental treatments given	8, 404
Cases handled by hospital service department	3, 470
Books circulated, patients' library	12, 701
Religious services held	106
Entertainments given for patients	60

*Marine Hospital No. 22, Vineyard Haven, Mass.*—Surg. H. M. Manning in charge. This hospital is well located on high ground, overlooking the beautiful Vineyard Haven Sound. Although small, it is an important refuge for sick and injured seamen from vessels passing near the port in the great lanes of ocean and coastwise commerce. It is also freely utilized by the United States Coast Guard. This hospital is one of many showing a greater number of patients for the year with a smaller number of hospital days and a consequent lower average period of treatment per patient in hospital. The total expenditures at this hospital for the year amounted to \$31,417.76.

*Marine Hospital No. 43, Ellis Island, N. Y.*—Senior Surg. E. K. Sprague, chief medical officer. To accommodate the overflow of patients from the marine hospital at Stapleton, which is inadequate in size for the needs of the port, an increasing number of American seamen have been admitted until they now outnumber the detained immigrants. See graphs (Fig. 4 and Fig. 5) on pages 236 and 237. The hospital is at present confronted with the problem of admitting large numbers of alien seamen from both American and foreign vessels who, having venereal or other communicable diseases, are now required by law to be confined to hospital while their ships are in port.

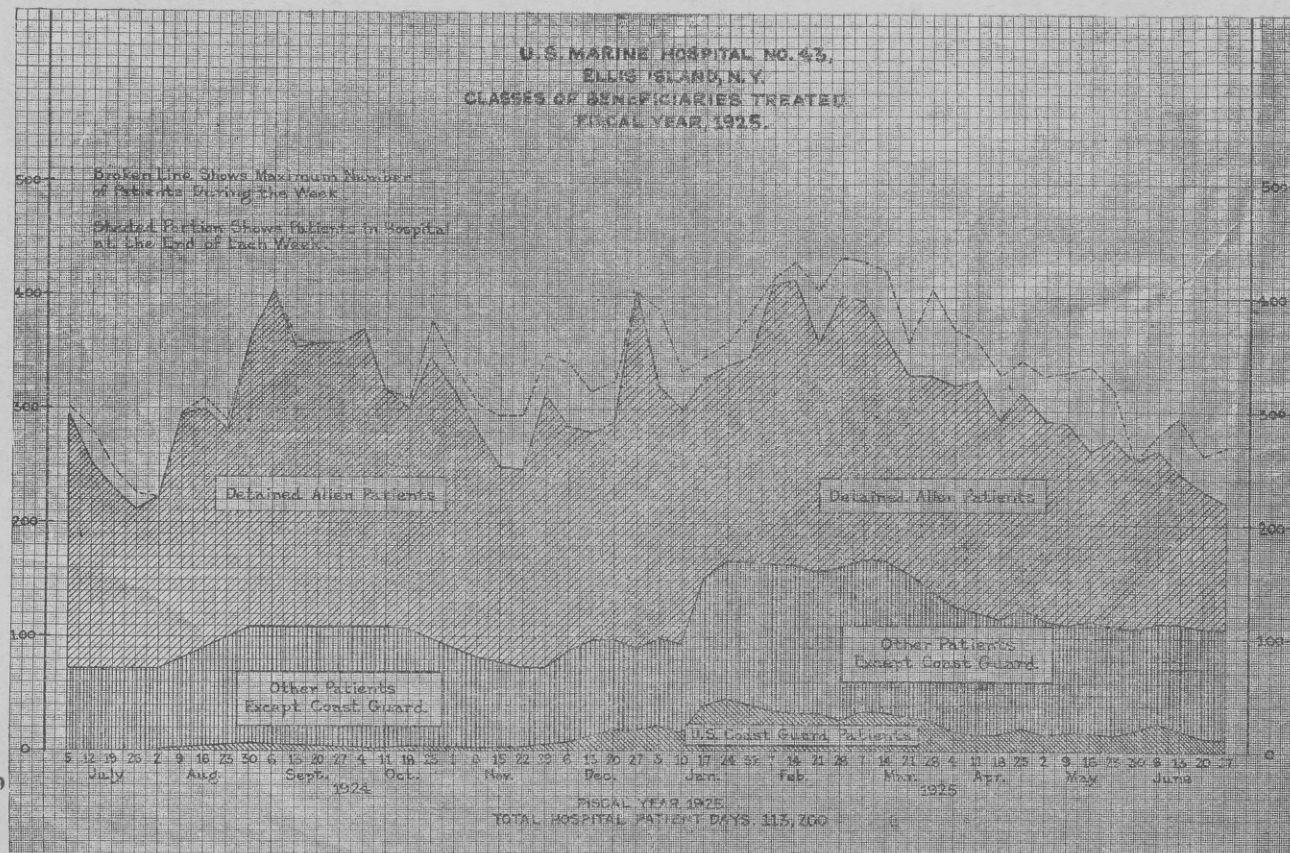


FIG. 4



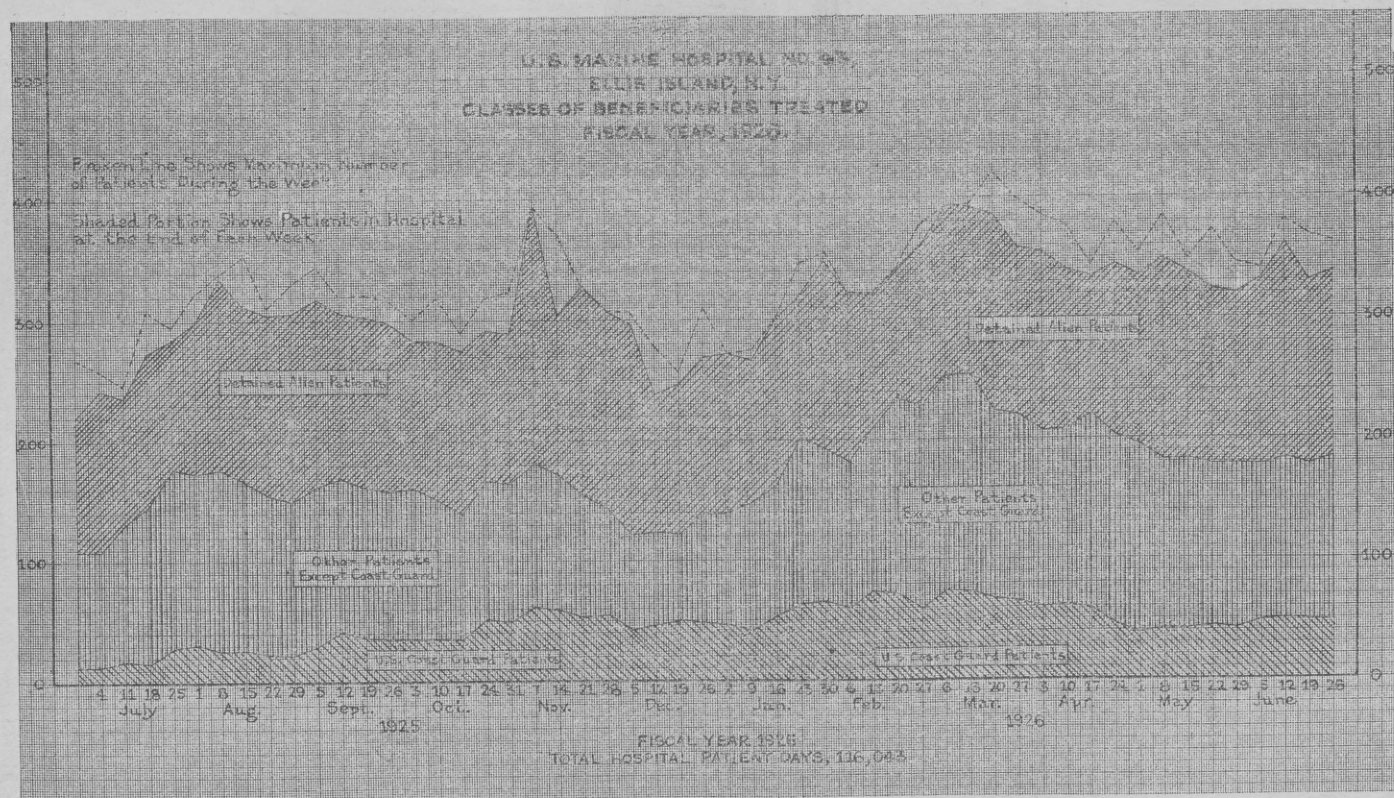


FIG. 5

The surgical work has increased with the advent of large numbers of patients admitted for treatment rather than for diagnosis. A dental officer was added to the staff. The X-ray laboratory made 6,363 exposures, the clinical laboratory 31,944 examinations, of which 6,901 were Wassermann tests for syphilis. The physiotherapy treatments were classified as follows:

Massage.....	1, 287
Electrotherapy.....	747
Thermotherapy.....	3, 102
Exercise.....	873
Total.....	6, 009

A special problem exists here requiring service workers, speaking several languages, to convey information to aliens in their own tongue, to assist patients to communicate with relatives, to protect them from unscrupulous persons, to adjust perplexing social problems, and occasionally to supply material relief from distressing conditions. The problem of handling visitors alone is a large one. Ambulatory patients are taken to the general reception rooms to receive visitors and only the relatives of bedfast patients are permitted to visit wards, thus eliminating congestion so far as possible.

The hospital buildings are in bad repair. A survey was made jointly by officials of the Immigration Service and a representative of this bureau and an estimate made of \$184,150 for necessary repairs and improvements, which was submitted to the Commissioner General of Immigration on July 9, 1925, with a view to having it included in budget items for the Immigration Service for the fiscal year 1927. The Commissioner General, however, after consideration of the matter, advised the bureau that it was found inexpedient to include these items in his estimates.

*Marine Hospital No. 66, Carville, La.* (National Leper Home).—Surg. (R) O. E. Denney in charge. Since the Public Health Service assumed operation in 1921 of this institution (formerly the Louisiana Leper Home) 394 lepers have been admitted. In the last fiscal year 62 lepers were admitted, 25 absconded, and 13 absconders returned for readmission. Three patients were discharged from hospital, leprosy arrested and no longer requiring treatment, and one was deported by the Bureau of Immigration. Of significance, with reference to the manner in which leprosy is contracted, is the fact that in the hospital there are six veterans of the Spanish-American War, 13 veterans of the World War, 3 veterans discharged from the military service because of disability, and 1 retired veteran, a total of 23 lepers who have had military service, some having had foreign tropical service, where the disease was probably contracted.

Seventy-five thousand surgical dressings were applied. Intravenous and intramuscular injections of mercurochrome, mercurophen, metaphen, bismuth, neosalvarsan, and tryparsamide have been continued in specific or experimental treatment. A total of 37,902 physiotherapy treatments were given. Chaulmoogra oil is being continued in a large group of patients.

The building program is incompletd and funds are required, especially for the construction of an infirmary building and to provide detention for the leprous insane and for absconders. (The annual report of this station will be reprinted in PUBLIC HEALTH REPORTS, Vol. 41, No. 46, November 12, 1926.)

*Marine Hospital No. 70, 67 Hudson Street, New York City.*—Surg. W. C. Billings in charge. Although fully equipped as a hospital in all matters except ward facilities, this institution is operated solely as a large out-patient office, with branch stations at the Barge Office, the Seamen's Church Institute, and in the general post office building, Thirty-third Street and Eighth Avenue. The bacteriological and Röntgenological laboratories, fully equipped and manned by trained technicians, the dental unit, with four dental officers and a dental mechanic, as well as the specialistic services in physiotherapy, eye, ear, nose, and throat, skin and syphilis, genitourinary diseases, surgery, medicine, orthopedic surgery, and mental and nervous diseases, are maintained at the hospital proper, to which patients requiring refined procedures in diagnosis and treatment are referred from the branch stations. A 24-hour ambulance service is maintained, the station acting as a distributor of patients to the marine hospitals at Stapleton and Ellis Island, respectively. It is desired to acknowledge the valuable cooperation of the Seamen's Church Institute, which continued to supply facilities for a branch out-patient office, at which also, in addition to routine work, first-aid instruction required by the Steamboat Inspection Service for applicants for ships' papers was given one hour daily five days per week by a service officer. The examinations in first-aid proficiency are given by a different medical officer at the Barge Office.

*Marine Hospital No. 82, Norfolk, Va.*—Surg. A. D. Foster in charge. The work here increased both in hospital and out-patient office. The acute character of the hospital service is seen in the fact that the average duration of treatment for all classes of patients was only 15.5 days, although a tuberculosis ward is maintained in accordance with the general custom prevailing in marine hospitals. The various classes of patients are indicated below:

	Per cent
United States Veterans' Bureau.....	2.2
Employees' Compensation Commission.....	7.0
United States Coast Guard.....	12.1
Seamen and all other beneficiaries.....	78.7

The clinical laboratory made 7,739 examinations, of which 1,931 were Wassermann tests for syphilis, all in connection with the examination and treatment of patients. The X-ray department examined 1,568 patients. It was moved from the basement to a more suitable location on the first floor of the main building and its equipment was improved. There were a large number of surgical operations, including major abdominal operations, such as appendectomy, gastroenterostomy, gastrectomy, and cholecystectomy. The professional relations of the hospital staff with the County Medical Society and local officers are such as to stimulate and maintain high hospital ideals. One meeting of the County Medical Society each year is devoted entirely to the United States Public Health Service.

*Relief Station No. 220, Cairo, Ill.*—Acting Asst. Surg. R. E. Barrows in charge. Although the old marine hospital here (No. 4) has been closed since 1915, with the exception of five and one-half months when it was reopened in 1919 for the care of ex-soldiers, a third-class relief station is operated and the quarters are occupied by the medical officer in charge and one other employee without



expense to the Government for fuel, light, gas, or water. The hospital reservation presents a neat appearance, care being taken to keep the grass mowed, trees, hedges and shrubbery trimmed, and lawn and drives in good condition. The principal classes of beneficiaries, chiefly out-patients, are seamen from river boats, an expansion in river traffic having occurred, and patients of the Employees' Compensation Commission whose responsibilities include injured men from construction gangs employed by the United States Government on near-by projects.

*Relief Station No. 245, Galveston, Tex.*—Asst. Surg. (R) E. M. F. Stephen in charge. A large amount of medical relief is furnished here. The out-patient office, consisting of five rooms, is centrally located in the customhouse and in close proximity to the contract hospital.

The number of physical examinations increased, but there was a decrease in the amount of medical treatment, due chiefly to a reduction in the appropriation, necessitating the discharge of patients from the contract hospital at the earliest possible date and the transfer of others to the marine hospital at New Orleans. Approximately 35 patients were in the hospital at all times, and approximately 40 out-patient treatments were rendered daily. Eight hundred forty-one patients were treated for venereal disease, and 1,939 intravenous treatments with neoarsphenamine were given. The contract hospital assigns for the exclusive care of service beneficiaries certain well-equipped wards connecting with consultation and treatment room, rest room, and other conveniences. The entire medical staff of the hospital is available for consultation and other assistance without compensation.

Physical examinations continue to be made of the crews of Shipping Board vessels, and applicants are examined and instructed in ship sanitation and first aid. Medical advice by radio was furnished to ships at sea. The agreeable relations enjoyed by the station with the city, county, and State health departments, and civic organizations were maintained throughout the year. The station is represented in the Galveston Federal Business Association, which was recently organized.

*Relief Station No. 258, Jacksonville, Fla.*—Surg. J. G. Townsend in charge. During 1926 quarantine and relief functions were combined in this port by removing the quarantine station from Mayport, Fla., to a point immediately below the city. A full-time medical officer now performs all service functions in the port, with an anticipated economy in expenditures and improvement in character of service.

*Relief Station No. 266, Los Angeles, Calif.*—Surg. R. H. Heterick in charge. Although the hospital work was decreased by diversion of a part of these activities to the relief station at San Pedro, a phenomenal increase in out-patient treatments has occurred, as set forth below:

	1923	1924	1925	1926
Out-patients treated.....	245	333	299	1,665
Number of treatments.....	662	865	826	3,872
Physical examinations.....	698	936	881	2,233



The medical officer in charge also supervises the first-aid station for Federal employees maintained by the Post Office Department at the arcade post office, where more than 2,000 out-patient treatments were given, not included in the above tabulations.

*Relief Station No. 270, Manila, P. I.*—Surg. H. F. Smith in charge. In the Philippine Islands service beneficiaries are given out-patient relief at three ports of entry, namely, Manila, Iloilo, and Cebu. Hospital relief is furnished only at the port of Manila. The out-patient offices are located in the several quarantine offices—at Manila and Iloilo in the customhouse and at Cebu in the quarantine building on the water front. The relief is supplied by the medical officers assigned to quarantine stations in addition to their other duties. Medicines and supplies were obtained from the supply depot of the service. There were 1,270 treatments given to 817 out-patients and 172 hospital patients were given an aggregate of 4,905 days' treatment. Physical examinations were made for the Bureau of Pensions, the Coast and Geodetic Survey, the Veterans' Bureau, and the Employees' Compensation Commission; also the complete physical examinations required by the Philippine government were made of all applicants for licenses as officers of vessels registered in the Philippine Islands.

*Relief Station No. 278, Milwaukee, Wis.*—Acting Asst. Surg. Robert J. Bach in charge. In addition to its local relief activities, this station supervises the relief at 21 Coast Guard stations and 32 light-houses. Its functions are fairly representative of those at the largest relief stations. By transferring 112 patients in need of hospital care to the marine hospital in Chicago the station was able to operate on restricted allowances. The medical officer in charge devoted 157 hours to giving required instruction in first aid to 68 pilots and other ships' officers applying for license, and made 395 calls at the contract hospital in connection with the care of service beneficiaries.

*Relief Station No. 305, Philadelphia, Pa.*—Senior Surg. W. G. Stimpson in charge. More than one-fifth of all patients were injured Federal employees sent by the Employees' Compensation Commission and nearly one-half of the surgical operations performed were for this class of beneficiaries. Merchant seamen, however, continue to constitute the major class of patients. Restriction in station allotments made it necessary to transfer all hospital patients able to travel to the marine hospitals in Baltimore and New York, thus reducing expenditures for contract hospital care.

*Relief Station No. 309, Port Arthur, Tex.*—Surg. A. R. Sweeney in charge. The medical officer in charge of this relief station also has charge of the United States quarantine stations at Sabine, Tex., and the Lake Sabine district quarantine station, common administrative offices being located in the Federal building. Although merchant seamen from American vessels constitute more than 90 per cent of the clientele, other classes of beneficiaries treated during the year included foreign seamen, Coast Guard men, lighthouse keepers, patients of the Employees' Compensation Commission, and, as examinees, pilots, applicants for the citizens' military training camps, civil-service employees, and alien seamen.

*Relief Station No. 326, San Juan, P. R.*—Surg. O. H. Cox in charge. This is a combined relief and quarantine station, with one medical officer in charge of all activities. The work of the United

States Veterans' Bureau was separated during the year, but cooperative relations are maintained. The principal beneficiaries are now merchant seamen, civilian employees from United States Army vessels, personnel from the vessels of the Coast and Geodetic Survey, and from the Lighthouse Service, and patients from the Employees' Compensation Commission. Venereal disease heads the list of disabilities.

It is desired to acknowledge the courtesy of various steamship companies whereby, in accordance with a not uncommon custom, many ships' patients were given free transportation to various ports of the United States when needing further treatment in marine hospitals.

*Relief Station No. 355, San Pedro, Calif.*—Surg. H. A. Spencer in charge. There was a very great increase in the clinical work at this station over the previous year, as indicated in the following table:

	1925	1926
Total number of patients treated.....	2,425	3,890
Total number treated in hospitals.....	5	336
Died.....	1	9
Number of days of relief in hospital.....	6	3,552
Number of patients furnished office relief.....	2,420	3,554
Number of times office relief was furnished.....	4,478	9,054
Number of physical examinations.....	600	618

The amount of local contract hospital care was reduced by the transfer from time to time during the year of 75 patients to the marine hospital in San Francisco when beds were available there and the station was thus enabled to operate on a restricted allotment.

*Relief Station No. 339, Washington, D. C.*—Surg. G. L. Collins in charge. This station, well located in the Post Office Department Building, handles a very large amount of work for the Employees' Compensation Commission, the majority of patients being injured Federal employees. Of the 7,065 persons given physical examinations, 4,625 were civil-service applicants. The clinical laboratory made 1,766 examinations, of which 580 were Wassermann blood tests. The X-ray laboratory made 2,313 exposures.

*Supply Station, Perry Point, Md.*—Associate Medical Purveyor C. H. Bierman in charge. The stock of the supply station consists of Army surplus supplies and other material for hospital and dispensary use purchased from time to time to apply on requisitions. Certain pharmaceutical preparations are made here at a saving in costs.

Items of supplies or equipment are never purchased until it has been ascertained whether there is a reasonable substitute in the surplus stock. During the year a considerable portion of the surplus stock was transferred to other governmental agencies, in order to prevent possible deterioration and to relieve the service of the care of supplies in excess of normal requirements. Based on the total value of supplies received and shipped, the station was operated at a cost of \$0.0657 on the dollar.

TABLE 1.—Number of patients treated annually, 1868 to 1926<sup>1</sup>

Fiscal year	Sick and disabled patients furnished relief	Fiscal year	Sick and disabled patients furnished relief
Prior to reorganization:		After reorganization—Continued:	
1868.....	11, 535	1897.....	54, 477
1869.....	11, 356	1898.....	52, 709
1870.....	10, 560	1899.....	55, 489
After reorganization:		1900.....	56, 355
1871.....	14, 256	1901.....	58, 381
1872.....	13, 156	1902.....	56, 310
1873.....	13, 529	1903.....	58, 573
1874.....	14, 356	1904.....	58, 556
1875.....	15, 009	1905.....	57, 013
1876.....	16, 808	1906.....	54, 363
1877.....	15, 175	1907.....	55, 129
1878.....	18, 223	1908.....	54, 301
1879.....	20, 922	1909.....	53, 704
1880.....	24, 860	1910.....	51, 443
1881.....	32, 613	1911.....	52, 209
1882.....	36, 184	1912.....	51, 078
1883.....	40, 195	1913.....	50, 604
1884.....	44, 761	1914.....	53, 225
1885.....	41, 714	1915.....	55, 782
1886.....	43, 822	1916.....	58, 357
1887.....	45, 314	1917.....	64, 022
1888.....	48, 203	1918.....	71, 614
1889.....	49, 518	1919.....	79, 863
1890.....	50, 671	1920.....	110, 907
1891.....	52, 992	1921.....	144, 344
1892.....	53, 610	1922.....	153, 633
1893.....	53, 317	1923 <sup>2</sup> .....	126, 956
1894.....	52, 803	1924.....	159, 686
1895.....	52, 643	1925.....	204, 944
1896.....	53, 804	1926.....	245, 140

<sup>1</sup> These figures do not include patients treated in connection with veterans' relief activities of the service, as follows: 1918, 192; 1919, 13,856; 1920, 279,036; 1921, 667,832; 1922, 242,379; 1923, 9,704; 1924, 3,414; 1925, 4,360, and 1926, 3,749.

<sup>2</sup> In this year the practice of recounting out-patients applying for treatment in more than one calendar month was discontinued.

TABLE 2.—Transactions at United States marine hospitals and other relief stations, fiscal year 1926

Station and location	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1926	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
Grand total.....	248, 889	42, 290	872	3, 420	1, 321, 309	206, 599	575, 139	91, 553
FIRST-CLASS STATIONS								
MARINE HOSPITALS								
1. Baltimore, Md.....	6, 224	1, 389	43	138	54, 884	4, 835	19, 793	2, 803
2. Boston, Mass.....	4, 531	1, 567	38	102	48, 949	2, 964	7, 854	3, 233
3. Buffalo, N. Y.....	3, 850	759	16	53	22, 564	3, 091	13, 258	1, 455
5. Chicago, Ill.....	34, 517	959	35	123	43, 719	33, 558	66, 614	1, 861
6. Cleveland, Ohio.....	3, 868	1, 165	23	76	27, 570	2, 703	7, 245	1, 401
7. Detroit, Mich.....	2, 613	893	15	60	25, 588	1, 720	5, 747	2, 074
8. Evansville, Ind.....	330	210	5	33	14, 338	120	373	86
9. Fort Stanton, N. Mex.....	1, 193	409	24	231	82, 669	784	3, 095	180
10. Key West, Fla.....	1, 169	330	6	27	9, 240	839	1, 398	83
11. Louisville, Ky.....	1, 318	1, 000	12	46	16, 846	318	1, 058	358
12. Memphis, Tenn.....	1, 009	684	7	31	14, 201	325	884	278
13. Mobile, Ala.....	3, 250	921	19	82	28, 953	2, 329	9, 166	2, 426
14. New Orleans, La.....	6, 782	2, 952	45	318	129, 786	3, 780	15, 664	8, 571
15. Pittsburgh, Pa.....	1, 512	751	21	45	18, 752	761	2, 543	806
16. Portland, Me.....	1, 083	587	19	43	16, 397	496	1, 072	413
17. Port Townsend, Wash.....	1, 239	963	21	90	33, 371	276	887	102
18. St. Louis, Mo.....	1, 186	519	14	53	21, 226	667	4, 922	1, 007
19. San Francisco, Calif.....	11, 134	2, 688	76	269	104, 631	8, 446	29, 435	2, 300
20. Savannah, Ga.....	2, 761	877	23	76	41, 299	1, 884	5, 483	343
21. Stapleton, N. Y.....	5, 202	3, 470	89	259	97, 503	1, 732	4, 982	251
22. Vineyard Haven, Mass.....	435	215	9	13	8, 540	220	373	45
43. Ellis Island, N. Y.....	9, 099	8, 500	67	383	116, 043	599	779	227
66. Carville, La.....	990	319	29	259	94, 359	671	945	9
70. New York City, N. Y.....	23, 829					23, 829	100, 919	12, 489

TABLE 2.—Transactions at United States marine hospitals, etc.—Continued

Station and location	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1926	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief furnished	Number of physical examinations
FIRST-CLASS STATIONS—Continued								
MARINE HOSPITALS—continued								
82. Norfolk, Va. ....	7,617	2,196	35	152	62,302	5,421	10,390	2,867
Contract overflow hospitals .....	186	186	8	46	17,055			
Total .....	136,877	34,509	699	3,008	1,150,785	102,368	314,879	45,668
SECOND, THIRD, AND FOURTH CLASS STATIONS, ETC.								
255. Aberdeen, Wash. ....	412	64	2	5	1,102	348	404	32
200. Albany, N. Y. ....	61	11	2	2	216	50	264	134
201. Apalachicola, Fla. ....	86	13			180	73	160	—
202. Ashland, Wis. ....	104	29	2	2	487	75	96	11
203. Ashtabula, Ohio. ....	304	55	1		730	249	531	32
204. Astoria, Oreg. ....	201	28			421	173	345	302
301. Balboa Heights, Canal Zone. ....	823	373	10	12	7,043	450	677	1
207. Bangor, Me. ....	53	9			152	44	41	64
208. Bay City, Mich. ....	68					68	158	1
209. Beaufort, N. C. ....	208	22		4	370	186	951	28
210. Bellingham, Wash. ....	425	12	1		79	413	522	529
212. Biloxi, Miss. ....	54	6			34	48	136	19
213. Boothbay Harbor, Me. ....	71	17	1		128	54	111	14
215. Bridgeport, Conn. ....	11	10	1		75	1	1	13
217. Brunswick, Ga. ....	98	21			171	77	120	13
219. Burlington, Iowa. ....	28	17	1	2	266	11	13	1
220. Cairo, Ill. ....	351	90		2	1,013	261	748	36
221. Cambridge, Md. ....	32	15			265	17	17	—
223. Cape May, N. J. ....	940	70		2	640	870	2,612	235
224. Charleston, S. C. ....	703	94	2	3	988	609	1,313	194
226. Cincinnati, Ohio. ....	296	38		5	518	258	613	242
229. Cordova, Alaska. ....	159	43	1	3	961	116	137	—
230. Crisfield, Md. ....	799	27	5		291	772	2,322	4
234. Duluth, Minn. ....	675	71	1	6	704	604	865	283
236. Eastport, Me. ....	6					6	22	9
237. Edenton, N. C. ....	29					29	45	1
238. Elizabeth City, N. C. ....	123	6			87	117	244	47
352. El Paso, Tex. ....	156	15	3	1	414	141	796	133
239. Erie, Pa. ....	425	84	4	5	902	341	970	105
240. Escanaba, Mich. ....	60	15			151	45	60	6
241. Eureka, Calif. ....	172	39			351	133	319	38
235. Everett, Wash. ....	247	32	1	1	475	215	336	38
243. Fall River, Mass. ....	56	3		1	39	53	99	24
244. Gallipolis, Ohio. ....	178	61	2	5	1,101	117	223	14
245. Galveston, Tex. ....	4,380	636	10	17	12,431	3,744	13,350	1,579
246. Georgetown, S. C. ....	64					64	95	7
247. Gloucester, Mass. ....	538	23	4		214	515	1,766	196
248. Grand Haven, Mass. ....	81	7			155	74	115	53
249. Green Bay, Wis. ....	79	14		1	217	65	157	51
250. Gulfport, Miss. ....	69	5			50	64	126	120
251. Hancock, Mich. ....	90	5	2		31	85	123	56
252. Hartford, Conn. ....	15	15	1	1	334			—
254. Honolulu, Hawaii. ....	868	229	6	17	4,139	639	1,354	304
359. Houston, Tex. ....	615	119	1	6	2,214	496	1,877	120
258. Jacksonville, Fla. ....	939	129	4		1,325	810	1,211	332
260. Juneau, Alaska. ....	183	70	3	3	2,120	113	149	28
262. Ketchikan, Alaska. ....	1,176	177	4	8	2,595	999	1,530	47
263. Kodiak, Alaska. ....	38					38	61	1
264. La Crosse, Wis. ....	24	6			63	18	43	22
242. Lee Hall, Va. ....	2,670					2,670	4,004	32
265. Lewes, Del. ....	238	31	1		447	207	785	42
346. Little Rock, Ark. ....	39	1			11	38	91	163
266. Los Angeles, Calif. ....	1,891	226	6	17	6,507	1,665	3,872	2,233
268. Ludington, Mich. ....	111	12	2		249	99	392	13
269. Machias, Me. ....	37					37	101	17
270. Manila, P. I. ....	1,004	172	2	14	4,905	832	1,287	829
271. Manistee, Mich. ....	81	9	2		167	72	230	17
272. Manitowoc, Wis. ....	208	68			919	140	253	3
273. Marquette, Mich. ....	219	11			398	208	666	64
274. Marshfield, Oreg. ....	112	26			300	86	136	57
277. Menominee, Mich. ....	67	3			24	64	174	15
347. Miami, Fla. ....	366	78	2		813	288	523	48
278. Milwaukee, Wis. ....	1,176	269	3	4	2,133	967	2,161	643
282. Nantucket, Mass. ....	371	17	1		110	354	474	38
283. Nashville, Tenn. ....	27	2			30	25	52	79
284. Natchez, Miss. ....	118	12	1	1	200	106	195	14
285. New Bedford, Mass. ....	397	27		1	492	370	661	626



TABLE 2.—Transactions at United States marine hospitals, etc.—Continued

Station and location	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1926	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
SECOND, THIRD, AND FOURTH CLASS STATIONS, ETC.								
286. New Bern, N. C.	230	79	1	4	835	151	284	48
288. New Haven, Conn.	68	17	1		267	51	143	152
289. New London, Conn.	477	154	2		2,264	323	427	73
291. Newport, Ark.	10					10	30	
292. Newport, Oreg.	72	5			36	67	164	11
293. Newport, R. I.	251	63	5	3	684	188	280	19
294. Newport News, Va.	221					221	284	48
295. Nome, Alaska.	28	12			90	16	60	4
297. Ogdensburg, N. Y.	141	15			412	126	274	39
298. Oswego, N. Y.	209	19			159	190	635	39
300. Paducah, Ky.	262	30	2	1	358	232	917	30
306. Panama City, Fla.	31					31	48	
302. Pensacola, Fla.	502	81			883	421	1,355	52
303. Perth Amboy, N. J.	75	13			262	62	103	35
304. Petersburg, Alaska	46	2			9	44	147	
305. Philadelphia, Pa.	3,758	542	8	19	5,088	3,216	12,180	4,286
307. Ponce, P. R.	45	20		1	217	25	29	6
308. Port Angeles, Wash.	257	12			69	245	393	99
309. Port Arthur, Tex.	1,265	189	5	4	1,546	1,076	3,264	127
310. Port Huron, Mich.	295	20			162	275	834	179
312. Portland, Oreg.	1,367	203	2	13	3,825	1,164	2,920	985
356. Portsmouth, N. H.	2	1			11	1	1	1
314. Providence, R. I.	419	63		2	726	356	578	266
315. Provincetown, Mass.	99					99	237	41
316. Richmond, Va.	127	21			275	106	300	79
317. Rock Island, Ill.	1,922	8		1	94	1,914	7,397	2,148
318. Rockland, Me.	157	2			27	155	282	45
320. Saginaw, Mich.	18	2		1	10	16	40	
319. St. Thomas, Virgin Islands	113	20	1		335	93	149	30
354. Salem, Mass.	1					1	1	1
323. San Diego, Calif.	547	72	4	19	4,478	475	651	478
324. Sandusky, Ohio.	42	5			44	37	68	20
326. San Juan, P. R.	941	468	7	11	23,818	473	845	441
355. San Pedro, Calif.	3,890	336	9	11	3,552	3,554	9,054	618
327. Sault Ste. Marie, Mich.	829	217	1	7	2,199	612	1,696	99
329. Seattle, Wash.	14,339	153	6	10	4,035	14,186	17,016	10,614
331. Sheboygan, Wis.	66	1			2	65	146	30
328. Sitka, Alaska.	42	6			69	36	63	2
332. Solomons, Md.	206	8			73	198	285	
334. South Bend, Wash.	68	22	1	2	132	46	87	14
361. Southport, N. C.	331					331	597	40
335. Superior, Wis.	287	76	4	5	1,087	211	373	9
345. Tacoma, Wash.	298	24	1	2	259	274	450	99
336. Tampa, Fla.	899	110	3	8	1,535	789	1,042	379
337. Toledo, Ohio	662	131	6	5	1,792	531	1,154	208
357. Unalaska, Alaska.	1	1			21			
338. Vicksburg, Miss.	381	98	3	4	951	283	765	68
339. Washington, D. C.	2,246	160	5	9	2,191	2,086	19,898	7,065
360. Washington, D. C. (dental clinic)	931					931	9,780	
340. Washington, N. C.	102	21			186	81	139	17
341. Whitestone, Va.	396					396	1,710	11
362. Wilmington, Del.	143	7			52	136	374	40
342. Wilmington, N. C.	484	62			432	422	1,245	223
MISCELLANEOUS								
Black Mountain, N. C. (Cragmont Sanatorium)	4	4		3	1,095			
Curtis Bay, Md.	2,276					2,276	5,570	124
Freeport, Tex.	2	2			42			5
New London, Conn. (destroyer force and academy)	20,101	309	2	11	2,174	19,792	42,080	1,904
Philadelphia, Pa. (U. S. Coast Guard receiving unit)	81	8	2		93	73	129	36
Washington, D. C. (St. Elizabeths Hospital)	124	124	13	105	37,339			
Contract physicians for U. S. Coast Guard and Lighthouse Service	4,101	34			282	4,067	10,702	1,307
U. S. Coast Guard vessels	18,019					18,019	43,300	3,100
Total	112,012	7,781	189	412	170,524	104,231	257,260	45,885
Grand total	248,889	42,290	888	3,420	1,321,309	206,599	572,139	91,553

TABLE 3.—Relief furnished at United States marine hospitals and other relief stations, fiscal year 1928, classified by beneficiary

Beneficiary	Class of station	Total number of patients treated	Number of patients treated in hospital	Died	Patients remaining in hospital June 30, 1928	Number of days relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
American seamen	First-class stations	69,351	18,149	511	1,939	753,720	51,202	183,924	16,122
	Other relief stations	38,243	5,297	163	333	123,861	32,946	76,370	3,853
	Total	107,594	23,446	674	2,272	877,581	84,148	260,294	19,975
Foreign seamen	First-class stations	791	576	7	37	15,293	215	477	398
	Other relief stations	200	107	4	5	2,154	93	219	59
	Total	991	683	11	42	17,447	308	696	457
U. S. Coast Guard	First-class stations	8,171	3,200	14	157	62,114	4,971	13,414	8,926
	Other relief stations	26,771	991	8	23	9,416	25,780	57,978	5,741
	Coast Guard vessels	18,019					18,019	43,300	3,100
	Contract physicians	4,032	33			269	3,999	10,534	1,294
	Total	56,993	4,224	22	180	71,799	52,769	125,226	19,061
U. S. Army	First-class stations	366	20		1	162	346	817	413
	Other relief stations	254	7		1	70	247	577	653
	Total	620	27		2	232	593	1,394	1,066
U. S. Navy and Marine Corps	First-class stations	89	44	2	2	680	45	174	15
	Other relief stations	77	15			130	62	149	17
	Total	166	59	2	2	810	107	323	32
Mississippi River Commission	First-class stations	206	155	4	4	4,656	51	178	16
	Other relief stations	182	44		2	308	138	234	2
	Total	388	199	4	6	4,964	189	412	18
Seamen, U. S. Engineer Corps and Army Transport Service.	First-class stations	1,318	648	9	54	23,142	670	2,070	60
	Other relief stations	1,014	163		4	2,273	851	2,361	28
	Total	2,332	811	9	58	25,415	1,521	4,431	88

U. S. Lighthouse Service.....	First-class stations.....	924	276	6	28	8,895	648	1,527	114
	Other relief stations.....	768	123	2	11	2,496	645	1,571	157
	Contract physicians.....	69	1			13	68	168	13
	Total.....	1,761	400	8	39	11,404	1,361	3,266	284
U. S. Coast and Geodetic Survey.....	First-class stations.....	114	42	1	5	1,377	72	156	90
	Other relief stations.....	461	59	1	7	957	402	1,076	423
	Total.....	575	101	2	12	2,334	474	1,232	513
U. S. Employees' Compensation Commission.....	First-class stations.....	38,963	1,461	13	108	40,848	37,502	87,786	4,264
	Other relief stations.....	8,282	574	4	22	8,534	7,708	41,635	4,733
	Total.....	47,245	2,035	17	130	49,382	45,210	129,421	8,997
U. S. Veterans' Bureau.....	First-class stations.....	3,377	3,150	69	188	79,735	227	2,616	30
	Other relief stations.....	372	306	4		19,101	66	165	355
	Total.....	3,749	3,456	73	188	98,836	293	2,781	385
U. S. Immigration Service.....	First-class stations.....	7,607	5,942	19	210	58,476	1,665	6,216	167
	Other relief stations.....	247	50	3	4	728	197	743	84
	Total.....	7,854	5,992	22	214	59,204	1,862	6,959	251
U. S. Public Health Service officers and employees.....	First-class stations.....	5,061	498	12	14	6,843	4,563	15,318	972
	Other relief stations.....	1,013	5			68	1,008	7,912	28
	Total.....	6,074	503	12	14	6,911	5,571	23,230	1,000
Lepers.....	First-class stations.....	326	325	29	259	94,387	1	6	3
	Other relief stations.....								2
	Total.....	326	325	29	259	94,387	1	6	5
Pilots.....	First-class stations.....								3,868
	Other relief stations.....								2,653
	Total.....								6,521
U. S. Civil Service applicants and Post Office employees.....	First-class stations.....								8,778
	Other relief stations.....								10,673
	Total.....								19,451
Bureau of Pensions.....	First-class stations.....								209
	Other relief stations.....								612
	Total.....								821

TABLE 3.—*Relief furnished at United States marine hospitals and other relief stations, fiscal year 1926, classified by beneficiary—Con.*

Beneficiary	Class of station	Total number of patients treated	Number of patients treated in hospital	Died	Patients remaining in hospital June 30, 1926	Number of days relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
Miscellaneous.....	First-class stations.....	213	23	3	2	457	190	200	1,223
	Other relief stations.....	12,008	6	-----	-----	146	12,002	12,268	11,405
	Total.....	12,221	29	3	2	603	12,192	12,468	12,628
Totals.....	First-class stations.....	136,877	34,509	699	3,008	1,150,785	102,368	314,879	45,668
	Other relief stations.....	89,892	7,747	189	412	170,242	82,145	203,258	41,478
	Coast Guard vessels.....	18,019	-----	-----	-----	-----	18,019	43,300	3,100
	Contract physicians.....	4,101	34	-----	-----	282	4,067	10,702	1,307
	Grand total.....	248,889	42,290	888	3,420	1,321,309	206,599	572,139	91,553



TABLE 4.—*Causes of admission for discharged patients and condition on discharge, United States marine hospitals and other relief stations, fiscal year 1926*

Disease or condition	Number having specified disease or injury <sup>1</sup>					Condition on discharge of patients admitted for specified disease or injury				
	Major conditions for which admitted <sup>2</sup>	Condition second in importance	Condition third in importance <sup>3</sup>	Sequelae to major condition	Total number of persons having each specified disease or injury	Cured	Improved	Not improved	Died	Other conditions
Abnormalities and congenital malformations.....	32					8	8	1		15
Blood and blood-forming organs, diseases and injuries of.....	53					2	28		7	16
Bones and cartilages, diseases and injuries of.....	1,666					437	670	6	37	516
Circulatory system, diseases and injuries of:										
Heart disease, valvular.....	336	239	58	12	645	1	196	1	59	79
Varicose veins.....	142	53	22		217	47	64	1		30
All others.....	713					80	348	6	104	175
Communicable and infectious diseases, not including tuberculosis and venereal:										
Conjunctivitis, granular trachomatous.....	24	11	3		38	1	10			13
Dengue.....	13	1			14	5	7			1
Influenza.....	826	26	5		857	491	243		8	84
Malaria.....	295	37	5	1	338	91	139		2	63
Rheumatic fever, acute.....	130	14	6	7	157	43	62		1	24
Typhoid fever.....	92	6			98	50	21		14	7
All others.....	417					284	75	1	10	47
Dental.....	209					47	71			91
Digestive system, diseases and injuries of:										
Appendicitis.....	680	98	15		793	367	194		12	107
Gastritis.....	421	43	11		475	161	195	1	2	62
Hemorrhoids.....	480	134	41		655	246	152		2	80
All others.....	1,165					412	502	7	27	217
Ear, nose, and throat, diseases and injuries of:										
Deviation, nasal septum.....	226	108	44		378	107	68	1		50
Otitis media.....	171	69	22	1	263	27	90	2	1	51
Tonsillitis.....	1,891	599	87	1	2,578	1,113	556			222
All others.....	712					300	281	3	5	123
Endocrines, diseases and injuries of.....	155					9	86	1	8	51
Eye and annexa, diseases and injuries of.....	345					69	161	6	1	108
Genito-urinary system, diseases and injuries of (exclusive of venereal):										
Nephritis.....	204	103	32		339	6	89	2	43	64
All others.....	831					224	401	3	12	191
Hernia.....	1,251	335	44		1,630	723	265	6	10	247
Joints and bursæ, diseases and injuries of:										
Arthritis.....	688	160	67	236	1,151	125	381	7	11	164
All others.....	352					76	158	5		113
Leprosy.....	66				66		4		29	33
Lymphatic system, diseases and injuries of:										
Lymphadenitis.....	357	40	9	205	611	90	181			86
All others.....	20					9	7		1	3
Muscles, fasciæ, tendons, and tendon sheaths, diseases and injuries of.....	1,132					381	503	2	2	244

<sup>1</sup> Except in the case of specific diseases, statistics are given only for the major condition for which admitted.

<sup>2</sup> Represents number of discharges for each condition.

<sup>3</sup> Where sequelae were given, no third diagnosis was recorded.

NOTE.—This table does not include immigration patients discharged from U. S. Marine Hospital No. 43, Ellis Island, N. Y.

TABLE 4.—*Causes of admission for discharged patients and condition on discharge, United States marine hospitals and other relief stations, fiscal year 1926—Continued*

Disease or condition	Number having specified disease or injury					Condition on discharge of patients admitted for specified disease or injury				
	Major conditions for which admitted	Condition second in importance	Condition third in importance	Sequelae to major condition	Total number of persons having each specified disease or injury	Cured	Improved	Not improved	Died	Other conditions
Nervous system, diseases and injuries of:										
Epilepsy without psychosis.....	47	16			63	1	15	1		30
Neuritis.....	245	62	24	19	350	50	132		2	61
All others.....	426					69	196	10	29	122
Obstetric and gynecological conditions.....	21					8	7			6
Parasitic diseases:										
Uncinariasis.....	29	39	12		80	9	13			7
All others.....	157					43	75	1	1	37
Poisonings and intoxications:										
Alcohol (ethyl) poisoning, acute.....	164	17	4		185	62	71		2	29
Alcoholism, chronic (with out psychosis).....	61	4	1		66	10	35		3	13
All others.....	106					55	34	1	2	14
Psychiatric diseases:										
Drug addiction without psychosis.....	17	3			20	1	6			10
All others.....	316					33	105	10	9	159
Respiratory system, diseases and injuries of (exclusive of tuberculosis):										
Asthma.....	159	76	9		244	11	104	1	5	38
Bronchitis.....	859	231	49	22	1,161	295	414		4	146
Pleurisy.....	207	50	19	17	293	60	92	1	9	45
Pneumonia.....	280	52	15	19	366	103	87		62	28
All others.....	13					4	7			2
Skin and its appendages, diseases and injuries of.....	783					298	326	2	6	151
Tuberculosis:										
Tuberculosis, pulmonary.....	1,275	120	35		1,430	1	177	3	173	921
Tuberculosis (otherwise unclassified).....	85	25	1	8	119	4	37		6	38
Tumors:										
Carcinoma.....	163	35	7	2	207	18	34	3	62	46
All others.....	201					78	66		7	50
Venereal diseases:										
Chancroidal infections.....	949	116	26	615	1,706	251	453		2	243
Gonococcus infections.....	2,935	307	30	54	3,326	355	1,580	2	3	995
Syphilis.....	1,940	898	180		3,018	30	1,032	3	37	838
All others.....	35					11	11			13
Inoculations.....	36					6	28			2
Under observation.....	666									666
Miscellaneous:										
Cellulitis.....	254	30	10	23	317	91	96		3	64
All others.....	4,751					1,495	1,962	9	37	1,248
Total.....	33,275					9,484	13,411	109	872	9,399

TABLE 5.—*Causes of death in United States marine hospitals and other relief stations during fiscal year 1926*

Inter- national list No.	Cause of death	Number of deaths
PART I		
<i>I. Epidemic, endemic, and infectious diseases</i>		
1	Typhoid and paratyphoid fever.....	14
5	Malaria.....	1
6	Smallpox.....	2
7	Measles.....	1
11	Influenza.....	7
16	Dysentery.....	1
20	Leprosy.....	5
31	Tuberculosis of the respiratory system.....	168
32	Tuberculosis of the meninges and central nervous system.....	1
33	Tuberculosis of the intestines and peritoneum.....	1
36	Tuberculosis of other organs.....	3
37	Disseminated tuberculosis.....	6
38	Syphilis.....	26
40	Gonococcus infection.....	1
41	Purulent infection septicemia.....	2
<i>II. General diseases not included in Class I</i>		
43	Cancer and other malignant tumors of the buccal cavity.....	3
44	Cancer and other malignant tumors of the stomach and liver.....	28
45	Cancer and other malignant tumors of the peritoneum, intestines, and rectum.....	6
49	Cancer and other malignant tumors of other or unspecified organs.....	35
50	Benign tumors and tumors not returned as malignant.....	1
57	Diabetes mellitus.....	5
58	Anemia or chlorosis.....	6
60	Diseases of the thyroid gland.....	2
65	Leukemia and Hodgkins disease.....	2
66	Alcoholism, acute and chronic.....	5
<i>III. Diseases of the nervous system and of the organs of special sense</i>		
70	Encephalitis.....	2
71	Meningitis.....	8
73	Other diseases of the spinal cord.....	3
74	Cerebral hemorrhage, apoplexy.....	34
75	Paralysis without specified cause.....	3
76	General paralysis of the insane.....	5
84	Other diseases of the nervous system.....	1
86	Diseases of the ear and of the mastoid process.....	3
<i>IV. Diseases of the circulatory system</i>		
88	Endocarditis and myocarditis.....	16
89	Angina pectoris.....	2
90	Other diseases of the heart.....	135
91	Diseases of the arteries.....	17
92	Embolism and thrombosis (not cerebral).....	1
95	Hemorrhage without specified cause.....	6
96	Other diseases of the circulatory system.....	1
<i>V. Diseases of the respiratory system</i>		
97	Diseases of the nasal fossæ and their annexa.....	1
99	Bronchitis.....	2
100	Bronchopneumonia.....	28
101	Pneumonia.....	66
102	Pleurisy.....	6
105	Asthma.....	3
107	Other diseases of the respiratory system.....	3
<i>VI. Diseases of the digestive system</i>		
108	Diseases of the mouth and annexa.....	1
111	Ulcer of the stomach and duodenum.....	8
112	Other diseases of the stomach.....	2
113	Diarrhea and enteritis.....	3
116	Diseases due to other intestinal parasites.....	1
117	Appendicitis and typhlitis.....	12
118	Hernia.....	10
119	Other diseases of the intestines.....	2
122	Cirrhosis of the liver.....	2
124	Other diseases of the liver.....	3
126	Peritonitis without specified cause.....	5
127	Other diseases of the digestive system (cancer and tuberculosis excepted).....	4

TABLE 5.—*Causes of death in United States marine hospitals and other relief stations during fiscal year 1926—Continued*

Inter- national list No.	Cause of death	Number of deaths
PART I—Continued		
VII. Nonvenereal diseases of the genito-urinary system and annexa		
128	Acute nephritis .....	21
129	Chronic nephritis .....	41
131	Other diseases of the kidneys and annexa .....	2
132	Calculi of the urinary passages .....	1
133	Diseases of the bladder .....	1
134	Diseases of the urethra, urinary abscess, etc. ....	2
135	Diseases of the prostate .....	2
VIII. The puerperal state		
145	Other accidents of labor .....	1
IX. Diseases of the skin and of the cellular tissue		
151	Gangrene .....	1
153	Acute abscess .....	4
154	Other diseases of the skin and annexa .....	3
X. Diseases of the bones and of the organs of locomotion		
155	Diseases of the bones (tuberculosis excepted) .....	1
XIV. External causes		
171	Suicide by cutting or piercing instruments .....	2
178	Conflagration .....	2
179	Accidental burns (conflagration excepted) .....	4
182	Accidental drowning .....	3
183	Accidental traumatism by firearms (wounds of war excepted) .....	1
185	Accidental traumatism by fall .....	17
187	Accidental traumatism by machines .....	1
188	Accidental traumatism by other crushing (vehicles, railways, landslides, etc.) .....	4
201	Fracture (cause not specified) .....	14
202	Other external violence (cause not specified) .....	3
XV. Ill-defined diseases		
205	Causes of death not specified or ill-defined .....	10
	Total .....	872
PART II		
Causes of death of immigration patients at U. S. Marine Hospital No. 43, Ellis Island, N. Y.		
7	Measles .....	3
9	Whooping cough .....	1
31	Tuberculosis of the respiratory system .....	2
65	Leukemia and Hodgkin's disease .....	1
78	Epilepsy .....	1
90	Other diseases of the heart .....	2
91	Diseases of the arteries .....	1
97	Diseases of the nasal fossæ and their annexa .....	1
100	Broncho-pneumonia .....	1
117	Appendicitis and typhlitis .....	1
149	Following childbirth (not otherwise defined) .....	1
171	Suicide by cutting or piercing instruments .....	1
	Total .....	16
	Grand total .....	888



TABLE 6.—Number of patients of each class of beneficiary discharged from United States marine hospitals and other relief stations during the fiscal year 1926, by broad groups of conditions

Group	Class of beneficiary															
	Total	American seamen	Foreign seamen	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Mississippi River Commission	Seamen, U. S. Engineer Corps and Army Transport Service	U. S. Light-house Service	U. S. Coast and Geodetic Survey	U. S. Employees Compensation Commission	U. S. Veterans' Bureau	U. S. Immigration Service	U. S. Public Health Service officers and employees	Lepers	Miscellaneous
Abnormalities and congenital malformations.....	32	17		9							2	4				
Blood and blood-forming organs, diseases and injuries of.....	53	36	1	1				2				12	1			
Bones and cartilages, diseases and injuries of.....	1,666	1,060	34	109	1	2	2	18	18	4	327	76	2	11		3
Circulatory system, diseases and injuries of.....	1,191	805	7	80		1	10	32	21	5	34	176		19		1
Communicable and infectious diseases, not including tuberculosis and venereal.....	1,797	1,159	49	317	3	4	45	65	34	10	10	36	7	58		
Dental.....	209	118	8	53	1	1		3	4	2	3	12	1	3		1
Digestive system, diseases and injuries of.....	2,309	1,501	48	335	6	13	9	51	34	18	7	223	7	56		
Ear, nose, and throat, diseases and injuries of.....	3,437	1,746	29	688	6	8	26	56	42	13	14	659	4	144		2
Endocrines, diseases and injuries of.....	155	96		11			1	4	5		1	37				2
Eye and annexa, diseases and injuries of.....	345	203	5	42	1		1	11	6	2	40	25	2	5		
Genito-urinary system, diseases and injuries of (exclusive of venereal).....	1,035	777	7	90		1	5	21	10	4	13	96	3	8		
Hernia.....	1,251	769	10	61		2	2	32	12	2	241	109		10		1
Joints and bursæ, diseases and injuries of.....	1,040	660	14	110		1	3	12	10	3	80	136		11		
Leprosy.....	66	1													65	
Lymphatic system, diseases and injuries of.....	377	299	19	20		1	1	4	3		8	16	5	1		
Muscles, fasciæ, tendons and tendon sheaths, diseases and injuries of.....	1,132	620	19	201		1	1	24	16	1	214	19		16		
Nervous system, diseases and injuries of.....	718	452	13	72		1		19	13	2	20	113	2	10		1
Obstetrics and gynecological conditions.....	21	14						1				2		4		
Parasitic diseases.....	186	78	5	22			4	3		1	1	68	2	1		1
Poisonings and intoxications.....	331	218	2	42	1	3	4	16	2	2	21	12	1	7		
Psychiatric diseases.....	333	193	2	41	1		1		6		5	78	1	4		1
Respiratory system, diseases and injuries of (exclusive of tuberculosis).....	1,518	962	31	227	5	2	30	47	11	4	7	147	5	40		

TABLE 6.—Number of patients of each class of beneficiary discharged from United States marine hospitals and other relief stations during the fiscal year 1926, by broad groups of conditions—Continued

Group	Class of beneficiary															
	Total	American seamen	Foreign seamen	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Mississippi River Commission	Seamen, U. S. Engineer Corps and Atmy Transport Service	U. S. Light-house Service	U. S. Coast and Geo-detic Survey	U. S. Em-ployees Com-pensation Commission	U. S. Veter-ans' Bureau	U. S. Immi-gration Service	U. S. Public Health Service officers and em-ployees	Lepers	Miscel-laneous
Skin and its appendages, diseases and in-juries of.....	783	504	16	151	-----	2	4	22	15	-----	19	39	1	9	-----	1
Tuberculosis.....	1,360	828	14	38	-----	1	4	15	5	5	9	428	6	6	-----	1
Tumors.....	364	274	3	26	-----	-----	3	9	5	2	3	32	1	5	-----	1
Venereal diseases.....	5,859	4,507	156	607	-----	2	19	144	35	15	4	191	170	7	-----	2
Inoculations.....	36	-----	23	9	-----	-----	-----	-----	-----	-----	-----	-----	-----	4	-----	-----
Under observations.....	666	216	13	126	-----	-----	5	6	5	3	25	254	5	6	-----	2
Miscellaneous.....	5,005	3,072	109	520	1	11	19	117	49	17	774	250	11	46	-----	9
Total cases.....	33,275	21,185	637	4,008	26	57	199	734	361	115	1,882	3,250	237	491	65	28

TABLE 7.—Number of days in hospital for patients discharged during fiscal year 1926 from United States marine hospitals and other relief stations, by broad groups of conditions and class of beneficiary

Group	Class of beneficiary														
	Total	American seamen	Foreign seamen	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Mississippi River Commission	Seamen, U. S. Engineer Corps and Army Transport Service	U. S. Light-house Service	U. S. Coast and Geodetic Survey	U. S. Employees Compensation Commission	U. S. Veterans' Bureau	U. S. Immigration Service	U. S. Public Health Service Officers and Employees	Miscellaneous
Abnormalities and congenital malformations.....	681	501		74							14	92			
Blood and blood-forming organs, diseases and injuries of.....	3,559	2,221	50	37				15				1,229	7		
Bones and cartilages, diseases and injuries of.....	81,410	53,005	1,826	3,190	3	48	252	863	1,148	42	16,459	4,101	31	439	3
Circulatory system, diseases and injuries of.....	64,639	48,979	244	2,559		33	449	1,600	1,221	168	756	8,034		595	1
Communicable and infectious diseases, not including tuberculosis and venereal.....	31,121	21,252	1,287	3,966	16	27	555	1,115	576	100	196	1,354	94	583	
Dental.....	3,004	1,819	36	602	2	1		204	9	21	46	229	2	33	
Digestive system, diseases and injuries of.....	58,396	39,678	911	6,528	75	218	350	1,734	763	274	113	6,864	92	791	5
Ear, nose, and throat, diseases and injuries of.....	36,362	19,443	342	6,926	18	33	191	834	368	181	88	7,183	52	688	15
Endocrines, diseases and injuries of.....	7,706	4,939		510			6	129	211		5	1,906			
Eye and annexe, diseases and injuries of.....	10,138	6,767	129	434	12		19	664	77	9	746	1,115	114	26	26
Genito-urinary system, diseases and injuries of (exclusive of venereal).....	33,753	27,326	179	1,272		16	166	835	152	47	153	2,530	147	930	
Hernia.....	38,904	25,801	378	1,722		65	62	1,085	371	64	5,822	3,241		269	24
Joints and bursæ, diseases and injuries of.....	46,675	32,286	308	2,465		8	142	584	344	57	2,746	7,526		209	
Leprosy.....	36,912	49												36,863	
Lymphatic system, diseases and injuries of.....	11,844	10,030	658	232		20	33	99	61		165	470	74	2	
Muscles, fasciæ, tendons, and tendon sheaths, diseases and injuries of.....	18,685	11,121	234	2,953		15	23	402	368	5	3,162	275		127	
Nervous system, diseases and injuries of.....	53,854	42,195	524	1,247		5		1,057	289	31	716	7,623	83	57	27
Obstetrics and gynecological conditions.....		332						3				29		41	
Parasitic diseases.....	6,085	1,909	159	271			50	83		5	3	3,505	12	71	17
Poisonings and intoxications.....	4,261	3,106	28	203	7	33	22	323	16	67	184	237	2	33	
Psychiatric diseases.....	27,713	9,096	24	843	1		2		461		400	16,640	1	244	1
Respiratory system, diseases and injuries of (exclusive of tuberculosis).....	38,187	27,511	678	2,480	34	53	768	972	206	49	587	4,222	34	593	

TABLE 7.—*Number of days in hospital for patients discharged during fiscal year 1926 from United States marine hospitals and other relief stations, by broad groups of conditions and class of beneficiary—Continued*

Group	Class of beneficiary															
	Total	Ameri- can seamen	Foreign seamen	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Missis- sippi River Com- mission	Seamen, U. S. Engi- neer Corps and Atmy Trans- port Service	U. S. Light- house Service	U. S. Coast and Geo- detic Survey	U. S. Em- ployees Com- pen- sa- tion Com- mission	U. S. Veter- ans' Bureau	U. S. Immi- gration Service	U. S. Public Health Service officers and em- ployees	Lepers	Miscel- laneous
Skin and its appendages, diseases and injuries of	21,334	16,131	277	1,967		71	118	457	220		335	1,419	5	74		260
Tuberculosis	149,126	118,406	310	3,447		10	1,029	3,556	208	374	674	17,801	60	3,184		67
Tumors	13,655	11,675	146	508				76	130	63	16	50	773	53	130	35
Venereal diseases	218,996	175,370	5,167	15,545		25	352	4,498	1,155	546	71	10,898	5,261	62		46
Inoculations	147		70	68										9		
Under observations	5,666	2,132	85	884			28	19	64	39	200	2,160	19	34		2
Miscellaneous	113,020	74,541	2,452	7,382	2	139	305	2,455	867	173	14,184	9,242	462	629		187
Total	1,136,165	787,548	16,502	68,315	170	820	4,998	23,716	9,218	2,268	47,875	120,698	6,605	9,853	36,863	716

NOTE.—This table does not include immigration patients from U. S. Marine Hospital No. 43, Ellis Island, N. Y.



TABLE 8.—*Classification of out-patient treatments furnished at United States marine hospitals and other relief stations, fiscal year 1926*

Station	General medical	Dental	Eye, ear, nose, and throat	Neuropsychopathic	Tuberculosis	Surgical	Genito urinary	Inoculations and vaccinations	X ray	Physiotherapy	Total
Marine hospitals.....	59,391	45,198	25,756	44	367	98,811	45,753	6,814	1,933	30,812	314,879
Relief stations.....	66,194	14,024	12,573	252	199	51,757	24,625	22,091	1,395	10,148	203,258
Coast Guard vessels.....	15,865	6,106	3,474	41	29	8,333	4,886	4,523	38	5	43,300
Contract physicians.....	5,950	56	533	26	22	1,597	213	2,292	-----	13	10,702
Grand total.....	147,400	65,384	42,336	363	617	160,498	75,477	35,720	3,366	40,978	572,139

## DIVISION OF VENEREAL DISEASES

In charge of Asst. Surg. Gen. MARK J. WHITE

It is now eight years since the Division of Venereal Diseases was established as a part of the Public Health Service. While the act creating the division is specific, in that it deals exclusively with venereal diseases, it is, nevertheless, in definite harmony with prior legislation relating to the scope and purposes of Federal health activities. The Federal policy of cooperating with the State health departments was included in the act of 1893, and the authority to study and investigate diseases of man and conditions influencing the propagation and spread thereof was provided by an act in 1912. The same authorizations and policies were combined in the act which created the Division of Venereal Diseases. The importance of venereal disease control was such as to necessitate the establishment of a special division to carry on the work, which is universally recognized as an essential and productive activity of the greatest value.

The work of the division has developed mainly along the line of cooperative work with the State boards of health for the prevention and control of venereal diseases within the States. There has been built up a unified program of control activities throughout the country. Every State has enacted practically uniform laws or regulations having the force of law as a basis for a control program. Clinics have been established in all parts of the country, in which standard methods of diagnosis and treatment are employed, where indigent patients can receive modern scientific treatment without charge or for a nominal fee. Pamphlets, motion picture films, slides, and exhibits are prepared by the division and furnished to the board of health of each State for educational work. Standards have been established in the field of sex education. The reduction of the appropriation under which the division is operating is a serious drawback to the continuance of the program. For the fiscal year 1926 only \$75,000 was appropriated for the maintenance of the division—\$74,000 less than the amount for the previous year. There was no allowance made for allotments to States carrying on cooperative control activities. For the fiscal year 1927 the division will again have only \$75,000 for maintenance and expenses. It would seem that sufficient funds to support this activity, so essential to the public health, should be forthcoming.

### COOPERATIVE WORK WITH STATE HEALTH DEPARTMENTS

The extent as well as the nature of the cooperation with State health departments varies. At the present time there is in each

State, upon the State health officer's request and recommendation, a Federal appointee who acts as the venereal disease cooperating representative of the service. As a Government official he is also authorized to use the free mailing privilege for the official correspondence and literature required in the cooperative work. He is at the same time the venereal disease control officer of the State health department. In addition to this cooperation, it is practicable for the service to detail other representatives for the following kinds of work:

1. To promote community interest by conferences with local authorities, industrial and civic organizations, editors, other public-spirited citizens, nurses, midwives, social and probation workers, for the purpose of ameliorating conditions that facilitate the spread of venereal diseases.

2. To feature, from the viewpoint of venereal disease prevention, the importance of sex hygiene and the necessity of supervision of infected persons who are disinclined to continue treatment until cured.

3. To deliver venereal disease lectures to selected groups, such as industrial, commercial, and domestic employees, and to physicians who seek a fuller understanding of the venereal disease problem.

Requests received from schools, colleges, associations, or other groups for the detail of service lecturers or for other assistance to them in carrying on their own plans for promoting public interest in venereal disease work are referred to the State department of health having jurisdiction. If that department requests the Public Health Service to cooperate, assistance is given wherever practicable. This is one of the most important steps for the reason that it brings to the attention of residents of a State the fact that the control of venereal diseases within the State is the legal and exclusive function of their own State, county, and municipal health departments.

The cooperative work with the States affords concurrent opportunities for the practical study and investigation of the various conditions encountered, and the results are utilized by the division in improving its educational facilities.

In Kentucky the State health department's venereal disease program includes the appointing of individual physicians in the less densely populated sections for the treatment of indigent venereal disease patients and in promoting venereal disease prophylaxis throughout the State. These special features have been made the subject of studies and investigations by a service representative who was detailed for cooperative work with the State department of health, and it is believed that out of this study will come improvements in the measures for venereal disease control.

In the State of Indiana a special effort has been made to interest the probation and other custodial agencies in giving information concerning venereal diseases to delinquents in their charge and in having them examined for the detection and relief of disease. The studies and investigations in connection with this work include the use of the "Keeping Fit" and "Youth and Life" exhibits and of service publications with a view to determining to what extent they are useful in giving instruction to delinquents. Necessary revisions will be made as a result of these studies. For use in connection with this work the service prepared a special publication known as "Venereal Disease Manual for Social and Corrective Agencies," for which

there is considerable demand. In addition to the limited number officially distributed, over 1,800 copies have been purchased by individuals from the Superintendent of Documents.

It is realized that the social and corrective agencies come in contact with groups that are potent factors in the dissemination of venereal diseases, and the studies and investigations in this connection are for the purpose of more effectively controlling both the actual and potential sources of infection among the delinquent groups.

Plans for a state-wide keeping-fit campaign in Indiana have also been undertaken. This campaign is similar to that carried on in the State of Mississippi last year. In Georgia the work has consisted largely of lectures to women's organizations, working men and women, both white and colored, and special lectures to colored midwives. In the State of Tennessee similar work was begun.

### CLINICAL STUDIES AND INVESTIGATIONS

The work at the Hot Springs venereal disease clinic for indigents has been continued. Clinical studies and investigations are made, and all patients treated there are given special instruction in the necessity for the early detection of the diseases and their prompt and adequate treatment. Such patients are also instructed in the regulations controlling the interstate travel of infected persons. During the year 3,570 patients were examined. Of this number 2,211 were syphilitic, 857 had gonorrhea, and 11 chancroid. Total number of visits to the clinic for examination, treatment, or advice amounted to 68,251—an increase of 2,938 over 1925.

#### Diagnosis

Year	Wassermann tests			Spinal punctures	Dark field examinations		
	+	-	Total		+	-	Total
1925.....	1,799	3,191	4,990	351	53	18	71
1926.....	1,399	4,061	5,460	189	106	70	176
Increase.....		870	470		53	52	105
Decrease.....	400			168			

#### Treatment

Year	Arsphen-amin	Mercury	Spinal treatments	Gonorrhea	Chan-croid	Total
1925.....	12,713	18,580	285	19,315	60	50,953
1926.....	12,419	19,896	275	22,275	186	55,051
Increase.....		1,316		2,960	126	4,098
Decrease.....	294		10			

Various studies have been conducted during the year. A series of cases was treated with flumerin in response to a special request. A report of the results has been completed. Cardiographs of aortitis and aneurysm were made at the clinic for the preparation of strip



film views. At the present time a comparative study of the Kahn precipitation test, comparing it with the routine Wassermann technic, is under way. Proposed studies for the coming year are the treatment of late syphilis with malaria and experimental work with a view to determining the effect of tetra-ethyl lead on the spirochete.

The officer in charge of the division's venereal disease clinic at Hot Springs was detailed to deliver a course of lectures at the venereal disease institute of the Florida State Board of Health, which was attended by physicians of the State desirous of becoming more proficient in venereal disease work.

During the year the division prepared strip film views of syphilis and of skin diseases simulating syphilis, which were distributed to State health departments for use in their venereal disease work. These strip films were made from photographs obtained from a number of prominent syphilologists and dermatologists who were interested in promoting the control of venereal diseases and in stimulating the general practitioners to fortify themselves for the detection of the disease. The following is a list of the strip films:

- Primary syphilis.
- Congenital syphilis.
- Early syphilis (parts 1 and 2).
- Late syphilis (parts 1 and 2).
- Lesions of syphilis.
- Treponema pallidum*.
- Lesions simulating syphilis.
- Chancres.
- Cutaneous syphilis.
- Cutaneous syphilis in negro.
- Cardiographs of aortitis and aneurysm.

Four hundred and five sets of films were lent to State boards of health.

The Kentucky plan of appointing cooperative clinicians has been reported elsewhere.

#### SOCIAL STUDIES AND INVESTIGATIONS

"Venereal Disease Manual for Social and Corrective Agencies" was prepared as a result of studies and investigations made the previous year into the necessity for venereal disease control work among delinquent groups. The manual contains suggestions and other informative material emphasizing the following items:

1. The prompt detection and treatment of venereal diseases among persons coming under the actual and prospective observation, supervision, or control of juvenile, and other corrective agencies.
2. The clinical and social management of these cases, not only in the interest of personal health but as a protection to the public, and as an assurance against the infected individual becoming a public charge later as a result of inadequate treatment.
3. The prevention of venereal diseases among this group through proper instruction and social guidance.

This manual is especially designed for the use of court and probation officers, social workers, nurses, visiting teachers, policemen and policewomen, jailers and wardens, and superintendents and matrons of homes for dependent, delinquent, and defective classes.

Special work was undertaken with large industrial concerns, railroads, steamship companies, and large manufacturing plants in a number of the States for the purpose of interesting the management in promoting instruction for the prevention and relief of venereal diseases among their employees. Most of the concerns welcomed this work and purchased literature, placards, etc., for the use of their employees.

#### PUBLICATIONS

The "Venereal Disease Manual for Social and Corrective Agencies" (V. D. B. 81), mentioned above, is not available for free distribution. Because of the cost of printing and binding it is sold by the Superintendent of Documents, Government Printing Office, at 50 cents per copy.

In addition the division prepared and issued a folder (V. D. B. 80), entitled "Health Maintenance; Relief and Prevention of Venereal Diseases." This was the first of a health maintenance series to set forth the principal conditions which venereal diseases could cause, but which frequently are known under names that do not suggest their cause. Another publication, the placard "The Venereal Diseases" (V. D. B. 73B), is a revision of an earlier placard. It is designed for the information of the masses, and has been widely distributed and posted in lavatories of trains and railroads, large industrial plants, etc.

The publication, "Venereal Disease Information," during the past year has proved to be very popular, the Superintendent of Documents having received approximately 10,000 paid subscriptions, of which 150 are purchased by the British Social Hygiene Council for distribution to their branch offices throughout the British Empire. The other publication, "Social Pathology," which deals with the socio-economic aspects, although mimeographed and issued irregularly, has nevertheless created a growing demand. Eight thousand copies have been distributed. It is unfortunate that this information can not be furnished the public in printed form. If printed, there is no doubt that a large subscription list would be gotten, which would more than pay for the cost of its production and would certainly meet a very important demand.

#### EDUCATION WORK WITH NEWSPAPERS AND JOURNALS

The educational campaign carried on by means of newspapers and journals which was instituted during 1925 was carried forward successfully this year. It was found that certain journals readily took part in the movement to disseminate information concerning syphilis and gonorrhea. From all parts of the country came assurances of support. The number of articles published bears evidence to the value placed upon the effort.

Twenty-five special articles were prepared for distribution. The wide range of subjects is of interest: "Maine legislates against spread of venereal diseases," "Marriage and social diseases," "Massachusetts law permits change in venereal disease reporting," "Care of mothers urged," "Preventable deafness," "Overcrowding facilitates spread of social diseases," "Syphilis and heart disease," etc.

In addition to the labor papers and certain newspapers which cooperated so heartily the first year, articles have been accepted for publication by medical journals, women's journals, and agricultural journals.

#### WORK WITH THE COLORED POPULATION

Special work with the negro population was carried on this year in Georgia and Tennessee. During the five months the representative of the Division of Venereal Diseases was on this detail 130 meetings were held, with a total attendance of 18,199 persons. Films were shown in connection with 72 of these lectures. In all 4,800 pamphlets were distributed.

The special representative of the division was detailed to work in these States in cooperation with the State boards of health. The program outlined included the effecting of contacts with industrial workers, physicians, nurses, midwives, ministers, colleges, and fraternal groups. Physicians were shown the strip films and methods of treatment were demonstrated.

After five months of intensive work in these two States the division's representative feels that the work is particularly worth while.

Physicians have promised to give better cooperation and make full reports of cases of venereal diseases; teachers are ready to give more attention to sex hygiene and venereal disease instruction; and among the mass of the population there is better understanding of the significance of the campaign and need for treatment, due in large measure to public health activities.

Aside from the special work among the negroes, the regional consultant, who was on an educational detail in Georgia, talked to many negro women, nurses, midwives, attendants at insane hospitals, and to girls.

The educational facilities prepared by the service for use among the colored population continued in demand. Specially prepared exhibits have been adapted from the service exhibits. "Youth and Life," for colored girls and young women, and "Keeping Fit," for boys and young men, were used.

The articles prepared for the newspapers have been mentioned in another section of this report. The negro papers were particularly willing to use the articles to distribute this information among their readers, an activity which, it is believed, is of great value, though the exact extent of the good can not be measured.

#### PAMPHLETS, FILM SHOWINGS, LECTURES, EXHIBITS

The Public Health Service has received 12,235 requests for pamphlets. State boards of health have received from the public 28,891 similar requests, a total of 41,126 requests. Table 1 indicates the number of pamphlets purchased by States.

State boards of health borrowed or purchased 95 exhibits, 2 lantern slide sets, and 35 motion picture films. Table 2 lists these purchases by States.

The American Social Hygiene Association reports the sale of 402 exhibits, 8 sets of slides, and 30,458 pamphlets to State boards of health and others.

Lectures reported by State boards of health total 4,133, with an average attendance of 109. Exhibit material was used at 391 of these lectures. Total lectures for the year numbered 4,267. Four hundred and four film showings, average attendance 202, and 778 exhibit and slide showings, with an average attendance of 252, are reported.

A statistical report of the educational activities of the State boards of health is shown in Table 3.

CASES OF VENEREAL DISEASES REPORTED TO STATE BOARDS OF HEALTH	
Year	Disease and Number
<b>Chancroid</b>	
1919	7,843
1920	10,861
1921	13,226
1922	8,935
1923	7,777
1924	8,484
1925	6,742
1926	7,029
<b>Syphilis</b>	
1919	100,466
1920	142,869
1921	184,090
1922	171,824
1923	172,258
1924	194,936
1925	201,692
1926	215,547
<b>Gonorrhea</b>	
1919	131,193
1920	172,387
1921	189,927
1922	152,959
1923	156,826
1924	161,676
1925	166,208
1926	166,655

#### REPORTING OF VENEREAL DISEASES

Cases of venereal diseases reported to State boards of health from all sources amounted to 389,231. The full report is found in Table 4. This total is an increase of 3.89 per cent over last year.<sup>1</sup>

The accompanying diagram illustrates the progress made in venereal disease reporting from 1919 to 1926.

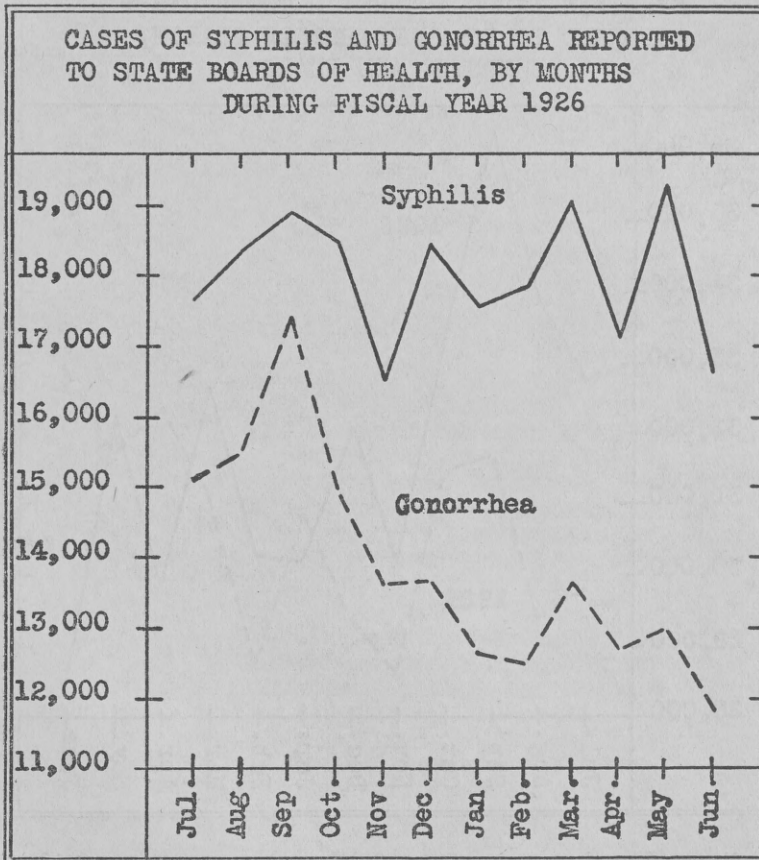
<sup>1</sup> The figure given in the 1925 annual report was 372,813. Additional data received since publication has changed that figure to 374,642.



Since there are reports from fewer clinics this year, the increase in the number of cases reported to State boards of health must be attributed to a more active interest in reporting venereal diseases on the part of physicians.

Table 5 shows the States ranked according to the percentage of increase or decrease in the number of cases reported to State boards of health. Thirty-seven States are listed. Incomplete return or change of method of reporting account for the omission of several, while other States have made no reports for 1926.

The accompanying graphs indicate the monthly variation in the cases of gonorrhea and syphilis reported in 1925-26.

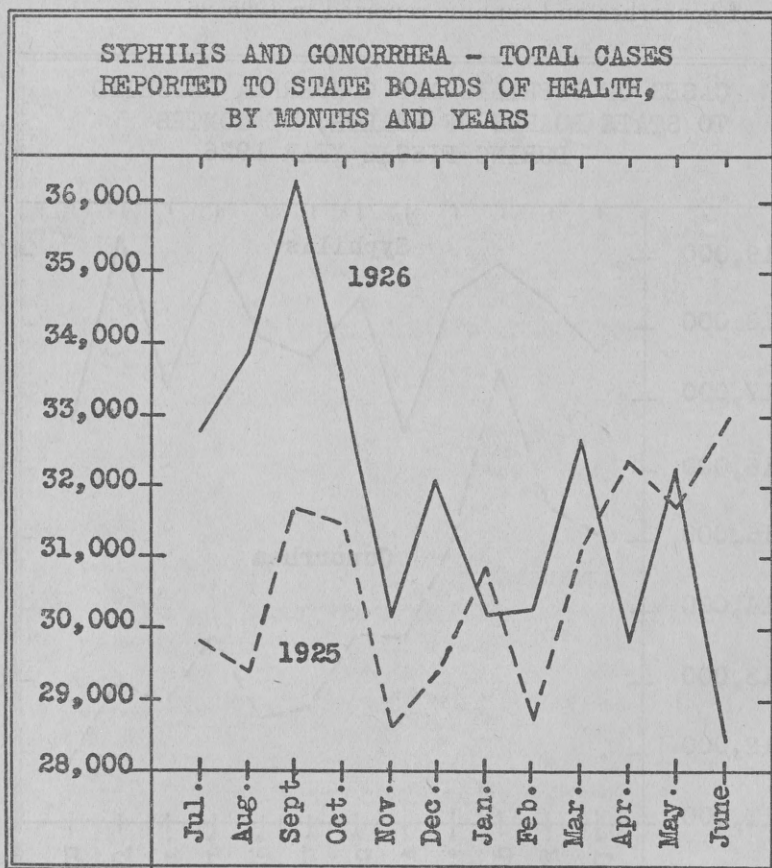


#### CLINICS

State boards of health report activities of 416 clinics. Last year reports were received from 495. Sixteen of the clinics from which no reports were received this year were reported discontinued, some for lack of funds. But the majority are accounted for by the fact

that the State boards of health of a number of States have discontinued sending clinic reports altogether.

Admissions to these 416 clinics totaled 100,776. In this number there are included 58,297 cases of syphilis, 39,636 of gonorrhea, and 2,843 of chancroid. The average number of admissions per clinic was 242. The number of patients discharged as noninfectious was 44,329, an average of 106 per clinic. The graph indicates the yearly averages of admissions and discharges from clinics for the eight years 1919-1926. (*See opposite page.*)



In diagnosing these cases 291,803 Wassermann tests and 188,674 microscopic examinations for gonococcus were made.

The total treatments given were 1,881,380. This number includes 482,403 doses of arsphenamin administered.

A complete report of clinics is contained in Table 6.

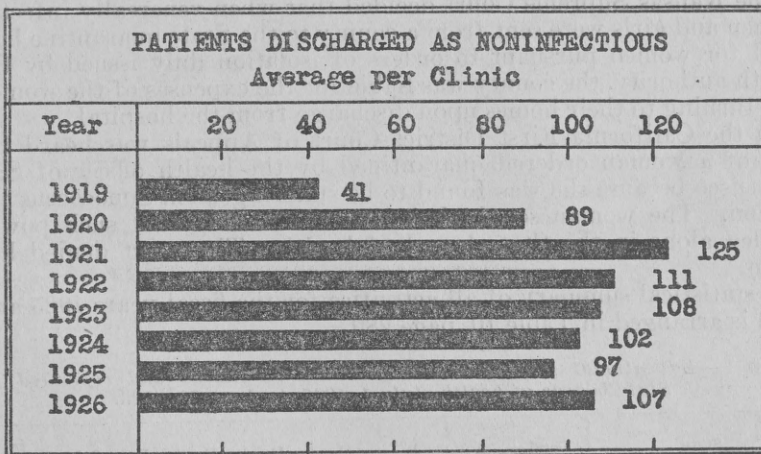
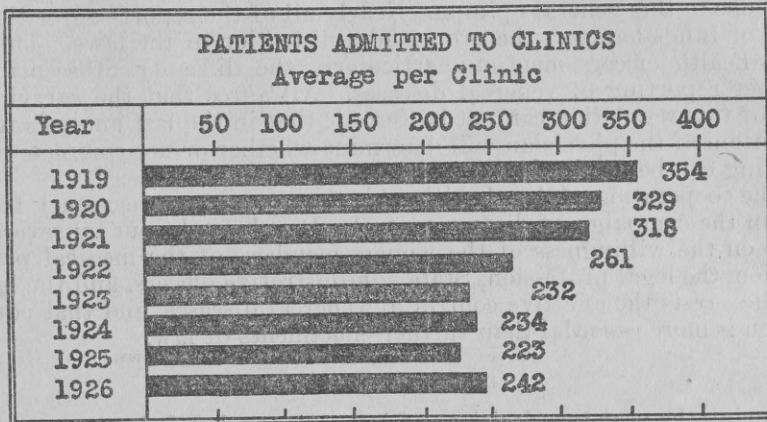
States ranked according to the monthly and daily average of admissions to clinics are shown in Table 7.

State boards of health report 651,785 doses of arsphenamin or similar product administered from July 1, 1925, to June 30, 1926.

The reports by States are found in Table 8.

## CORRECTIONAL AND PENAL INSTITUTIONS

Reports were received by the division from 33 correctional and penal institutions during the year. There were admitted to treatment 7,713, of whom 3,517 were suffering from syphilis, 4,063 gonorrhea, and 133 chancroid. Table 9 gives the numbers of treatments given, Wassermann tests made, etc.



## STATE LAWS AND REGULATIONS

## STATE LEGISLATION

The only report of a change in legislation comes from Ohio. The Ohio Sanitary Code was amended to permit physicians to report cases of venereal diseases by initials or case number in lieu of reporting by name of patient. In case reports are made by initials or number an office record must be kept whereby cases may be readily identified. This change was made on the recommendation of the medical profession.

In the past year an effort was made to evaluate the legal measures which have been in force touching on the control of the venereal diseases. A letter was sent to each State health officer asking for the venereal disease control laws and regulations of that State. In addition, the opinion of the health officer was sought in the matter of the value and effectiveness of these measures. The answers which were received from 35 health officers indicate that on the whole the legal measures are considered adequate. There are, however, striking exceptions to this general opinion. Nearly all of the reports agree that lack of funds hampers the proper administration of the laws. Thirteen health officers mention particularly the difficulty of securing proper reporting of venereal diseases. All agree that the carrying out of this regulation can not be forced; that in the last analysis the intention of the physician will determine whether or not complete reporting can be attained.

The cooperation of the physician is, of course, a most necessary factor in the campaign of disease control. It is brought out by several that on the willingness of the whole—members of the medical profession, the legal profession, State administrative officers, and the lay public—rests the effective control of venereal diseases, and that education is more essential than further enactments of law.

#### COURT DECISIONS

During the year two decisions of interest were handed down.

The Kansas Supreme Court decided that when venereally infected women and girls were sent from a county to the State quarantine hospital for women pursuant to orders of isolation duly issued by the health authority, the county was liable for the expenses of the women in returning to their homes upon discharge from the hospital.

In the California First District Court of Appeals was heard the case of a woman ordered quarantined by the health officer of San Francisco because she was found to be suffering from gonococcus infection. The woman sought her release, claiming that such power resided alone in the State board of health. The court denied her claim.

A statistical summary of all activities for the fiscal years 1925 and 1926 is arranged in Table 10, page 280.

TABLE 1.—*Educational pamphlets and placards purchased and reprinted by State boards of health, July 1, 1925, to June 30, 1926*

State	Total	A	B	C	D	E	F	Others	Placards
United States.....	731, 044	100, 500	55, 944	182, 400	149, 900	146, 400	16, 500	79, 400	-----
Alabama.....	21, 000	-----	-----	20, 000	-----	-----	1, 000	-----	-----
Arizona <sup>1</sup> .....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Arkansas.....	30, 000	-----	-----	10, 000	10, 000	10, 000	-----	-----	-----
California.....	38, 000	10, 000	-----	5, 000	11, 000	12, 000	-----	-----	-----
Colorado.....	4, 000	-----	-----	-----	-----	-----	-----	4, 000	-----
Connecticut.....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Delaware.....	-----	-----	-----	-----	-----	-----	-----	-----	-----
District of Columbia <sup>1</sup> .....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Florida.....	2, 000	-----	-----	-----	-----	-----	-----	2, 000	-----
Georgia.....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Idaho.....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Illinois.....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Indiana.....	60, 000	10, 000	10, 000	10, 000	5, 000	15, 000	-----	10, 000	-----
Iowa <sup>1</sup> .....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Kansas.....	10, 000	-----	-----	1, 000	5, 000	1, 000	3, 000	-----	-----

<sup>1</sup> Not reporting.

<sup>2</sup> Exclusive of 40,000 leaflets "Instructions to patients."



TABLE 1.—*Educational pamphlets and placards purchased and reprinted by State boards of health, June 1, 1925, to July 30, 1926—Continued*

State	Total	A	B	C	D	E	F	Others	Placards
Kentucky									
Louisiana	4,000	2,000				2,000			
Maine	900							900	
Maryland	6,544	6,000	544						
Massachusetts									
Michigan									
Minnesota	2,000			2,000					
Mississippi	40,000			20,000		20,000			
Missouri	30,000		10,000		10,000	10,000			
Montana									
Nebraska	130,000	15,000	15,000	15,000	30,000	30,000		25,000	
Nevada <sup>1</sup>									
New Hampshire									
New Jersey <sup>4</sup>	38,000	5,000		13,000	10,000	10,000			
New Mexico	2,000				2,000				
New York	19,500	7,500			500	500		11,000	
North Carolina <sup>1</sup>									
North Dakota	2,500		400	800	400	400	500		
Ohio									
Oklahoma <sup>1</sup>									
Oregon									
Pennsylvania	76,600	2,000		50,600	2,000	2,000		20,000	
Rhode Island	61,500	13,000	20,000	6,500	14,000	5,000	2,000	1,000	
South Carolina									
South Dakota									
Tennessee									
Texas									
Utah <sup>1</sup>									
Vermont									
Virginia	65,000	5,000		13,000	24,000	13,000	10,000		
Washington									
West Virginia	77,500	25,000		15,500	16,000	15,500		5,500	
Wisconsin	10,000				10,000				
Wyoming									

<sup>1</sup> Not reporting.<sup>3</sup> Exclusive of 5,000 score cards.<sup>4</sup> For 11 months only.

NOTE.—In the above table the letters A to F stand for the following groups: A, men; B, the general public; C, boys; D, parents; E, girls; F, educators.

TABLE 2.—*Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health, July 1, 1925, to June 30, 1926*

State	Exhibits	Slides	Films	State	Exhibits	Slides	Films
United States	95	2	35	Montana			
Alabama			4	Nebraska			
Arizona <sup>1</sup>				Nevada <sup>1</sup>			
Arkansas				New Hampshire			
California				New Jersey			
Colorado				New Mexico			
Connecticut			1	New York	12		7
Delaware				North Carolina <sup>1</sup>			
District of Columbia <sup>1</sup>				North Dakota			
Florida				Ohio			
Georgia				Oklahoma <sup>1</sup>			
Idaho				Oregon			
Illinois				Pennsylvania			
Indiana				Rhode Island	54	2	8
Iowa <sup>1</sup>				South Carolina			
Kansas				South Dakota			
Kentucky				Tennessee			
Louisiana				Texas			
Maine				Utah <sup>1</sup>			
Maryland				Vermont			
Massachusetts				Virginia			4
Michigan				Washington			
Minnesota	3			West Virginia	15		6
Mississippi				Wisconsin	11		
Missouri				Wyoming			

<sup>1</sup> Not reporting.<sup>2</sup> Includes 1-strip film.<sup>3</sup> Includes 4-strip films.

TABLE 3.—State report of educational activities, July 1, 1925, to June 30, 1926

State	Pamphlets distributed	Lectures			Film showings		Exhibit and slide showings	
		Number	Average attendance	Exhibit material used	Number	Average attendance	Number	Average attendance
United States.....	969,592	4,133	109	391	404	202	778	252
Alabama.....	24,551	247	99	—	5	300	—	—
Arizona <sup>1</sup> .....	—	—	—	—	—	—	—	—
Arkansas.....	19,057	66	170	—	1	83	434	103
California.....	25,911	11	40	—	101	244	—	—
Colorado.....	4,047	2	50	—	—	—	9	75
Connecticut.....	4,524	7	37	1	—	—	—	—
Delaware.....	—	1	100	—	—	—	6	333
District of Columbia <sup>1</sup> .....	—	—	—	—	—	—	—	—
Florida.....	11,143	3	42	—	—	—	—	—
Georgia.....	5,505	178	82	19	—	—	—	—
Idaho <sup>2</sup> .....	412	—	—	—	—	—	—	—
Illinois.....	55,318	—	—	—	—	—	—	—
Indiana.....	49,430	75	151	22	60	215	22	2,960
Iowa <sup>1</sup> .....	—	—	—	—	—	—	—	—
Kansas.....	5,118	—	—	—	—	—	—	—
Kentucky.....	21,521	50	125	—	6	135	—	—
Louisiana.....	3,612	1	110	2	17	149	—	—
Maine.....	3,827	137	96	—	—	—	—	—
Maryland.....	10,111	8	104	8	—	—	—	—
Massachusetts <sup>2</sup> .....	16,579	59	83	—	9	278	1	300
Michigan.....	—	—	—	—	—	—	—	—
Minnesota.....	17,509	64	67	—	—	—	—	—
Mississippi.....	10,803	16	677	2	2	50	2	38
Missouri.....	2,606	12	249	—	6	216	2	215
Montana <sup>3</sup> .....	3,422	5	226	—	46	145	14	92
Nebraska.....	144,780	13	81	—	2	475	—	—
Nevada <sup>1</sup> .....	—	—	—	—	—	—	—	—
New Hampshire.....	398	22	75	—	1	125	2	75
New Jersey <sup>2</sup> .....	31,872	327	111	4	—	—	—	—
New Mexico.....	2,836	—	—	—	—	—	2	175
New York.....	170,301	737	122	80	14	208	14	123
North Carolina <sup>1</sup> .....	—	—	—	—	—	—	—	—
North Dakota.....	5,009	1	50	1	—	—	1	150
Ohio.....	—	—	—	—	—	—	—	—
Oklahoma <sup>1</sup> .....	—	—	—	—	—	—	—	—
Oregon <sup>2</sup> .....	351	—	—	—	—	—	—	—
Pennsylvania.....	14,763	476	150	—	4	116	12	106
Rhode Island.....	65,807	90	286	31	—	—	48	63
South Carolina <sup>1</sup> .....	823	—	—	—	—	—	—	—
South Dakota.....	—	31	125	22	—	—	22	2,481
Tennessee.....	12,568	10	323	—	10	139	1	—
Texas <sup>2</sup> .....	33,472	—	—	—	—	—	—	—
Utah <sup>1</sup> .....	—	—	—	—	—	—	—	—
Vermont <sup>3</sup> .....	185	—	—	—	—	—	—	—
Virginia.....	48,218	273	94	28	50	209	—	—
Washington.....	1,167	—	—	—	—	—	—	—
West Virginia.....	105,262	232	157	159	40	189	167	105
Wisconsin.....	36,774	979	50	—	30	145	19	67
Wyoming.....	—	—	—	—	—	—	—	—

<sup>1</sup> Not reporting.<sup>2</sup> For 11 months only.<sup>3</sup> For 6 months only.<sup>4</sup> For 3 months only.<sup>5</sup> For 7 months only.

TABLE 4.—Cases of venereal disease reported to State boards of health, July 1, 1925, to June 30, 1926

State	Total	Syphilis	Gonorrhea	Chan-croid
United States .....	389, 231	215, 547	166, 655	7, 029
Alabama .....	15, 374	9, 710	5, 279	385
Arizona <sup>1</sup> .....	4, 508	2, 918	1, 530	60
Arkansas .....	19, 181	10, 629	8, 137	415
California .....	1, 965	507	1, 420	38
Colorado .....	2, 229	1, 135	1, 079	15
Connecticut .....	691	199	398	94
Delaware .....				
District of Columbia <sup>1</sup> .....	5, 947	3, 719	1, 921	307
Florida .....	11, 006	5, 719	4, 980	307
Georgia .....	378	84	292	2
Idaho <sup>2</sup> .....	30, 985	11, 349	19, 274	362
Illinois .....	4, 208	2, 099	1, 981	128
Indiana .....				
Iowa <sup>1</sup> .....	1, 588	569	1, 010	9
Kansas .....	41, 901	29, 332	12, 212	357
Kentucky .....	6, 873	3, 475	2, 917	481
Louisiana .....	842	245	587	10
Maine .....	6, 040	3, 194	2, 567	279
Maryland .....	6, 611	1, 883	4, 728	
Massachusetts <sup>2</sup> .....	25, 678	13, 963	11, 620	95
Michigan .....	10, 824	5, 150	5, 613	61
Minnesota .....	33, 666	13, 221	20, 249	196
Mississippi .....	7, 828	3, 936	3, 270	622
Missouri .....	74	21	53	
Montana <sup>3</sup> .....	3, 788	1, 195	2, 543	50
Nebraska .....				
Nevada <sup>1</sup> .....	410	207	203	
New Hampshire .....	7, 679	4, 561	3, 063	55
New Jersey <sup>2</sup> .....	336	81	248	7
New Mexico .....	38, 043	28, 889	9, 089	65
New York .....				
North Carolina <sup>1</sup> .....	1, 146	296	849	1
North Dakota .....	10, 812	5, 851	4, 596	365
Ohio .....				
Oklahoma <sup>1</sup> .....	1, 683	444	1, 235	4
Oregon <sup>2</sup> .....	5, 228	2, 592	2, 563	73
Pennsylvania .....	1, 032	438	593	1
Rhode Island .....	4, 816	1, 917	2, 893	6
South Carolina <sup>4</sup> .....	835	122	713	
South Dakota .....	24, 029	16, 614	6, 444	971
Tennessee .....	32, 419	18, 806	12, 755	858
Texas <sup>1</sup> .....				
Utah <sup>1</sup> .....	427	179	248	
Vermont <sup>5</sup> .....	2, 439	1, 682	706	51
Virginia .....	1, 932	764	1, 129	39
Washington .....	10, 477	7, 061	3, 204	212
West Virginia .....	3, 293	787	2, 458	48
Wisconsin .....	10	4	6	
Wyoming <sup>3</sup> .....				

<sup>1</sup>Not reporting.<sup>2</sup>For 11 months only.<sup>3</sup>For 6 months only.<sup>4</sup>For 3 months only.<sup>5</sup>For 7 months only.

TABLE 5.—States ranked according to the percentage of increase or decrease in the number of cases of venereal disease reported to State boards of health, 1926 over 1925

## STATES SHOWING INCREASE

Rank	State	Per cent	Rank	State	Per cent
1	Idaho (incomplete).....	1 47.08	10	South Dakota.....	8.16
2	West Virginia.....	27.36	11	Minnesota.....	6.65
3	Texas (incomplete).....	1 26.34	12	Maryland.....	6.64
4	Mississippi.....	24.62	13	Ohio.....	6.18
5	Delaware.....	21.02	14	New Jersey (incomplete).....	1 5.32
6	Alabama.....	19.43	15	Michigan.....	3.37
7	Nebraska.....	14.61	16	Pennsylvania.....	2.91
8	Washington.....	13.71	17	New York.....	.26
9	North Dakota.....	13.35			

## STATES SHOWING DECREASE

18	Illinois.....	0.86	28	Colorado.....	10.11
19	California.....	1.23	29	Indiana.....	11.28
20	New Hampshire.....	4.21	30	Connecticut.....	11.86
21	Georgia.....	5.08	31	Oregon (incomplete).....	1 12.53
22	Kentucky.....	5.30	32	Florida.....	15.35
23	Wisconsin.....	5.40	33	Kansas.....	17.08
24	Rhode Island.....	5.49	34	New Mexico.....	24.49
25	Arkansas.....	6.97	35	Maine.....	25.94
26	Louisiana.....	7.37	36	Virginia.....	27.17
27	Missouri.....	9.20	37	Massachusetts (incomplete).....	1 37.52

<sup>1</sup> Figures for 1926 are for 11 months only.

NOTE.—Owing to incomplete returns from Montana, South Carolina, Vermont, and Wyoming, and a change in the method of reporting in Tennessee, the figures for these States are not comparable and have been omitted from the above table. Arizona, Iowa, North Carolina, Oklahoma, and Utah did not report for 1926 and also have been omitted.

TABLE 6.—Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926

State and city	Total monthly reports received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsenphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
United States.....	4,410	100,776	58,297	39,636	2,843	44,329	1,881,380	482,403	291,803	188,674
Alabama.....	168	10,697	7,770	2,678	249	6,269	127,222	47,396	16,637	2,596
Cooperative.....	12	3,251	1,879	1,230	142	2,112	28,964	10,939	3,560	661
Albany.....	12	455	402	46	7	424	3,897	2,596	1,591	118
Anniston.....	12	116	109	7	—	49	1,888	830	287	17
Bessemer.....	12	300	263	37	—	315	4,372	1,189	149	64
Birmingham (2).....	24	3,542	2,875	665	2	1,732	39,549	14,812	6,548	795
Gadsden.....	12	80	39	37	4	84	2,227	452	130	50
Huntsville.....	12	167	63	97	7	298	6,036	1,573	801	576
Mobile.....	12	1,461	1,180	262	19	779	23,437	9,072	1,521	103
Montgomery.....	12	474	356	87	31	—	6,212	1,752	335	—
Riderwood.....	12	59	44	14	1	7	469	355	41	5
Selma.....	12	169	159	10	—	57	3,132	1,108	455	—
Talladega.....	12	158	73	82	3	43	2,025	986	629	75
Tuscaloosa.....	12	465	328	104	33	369	5,014	1,732	590	132
Arkansas.....	81	3,746	2,655	1,044	47	3,238	64,518	15,768	9,962	3,487
Fort Smith.....	12	50	50	—	—	15	534	534	84	—
Hot Springs (2).....	22	2,727	1,968	746	13	3,002	57,773	12,550	5,622	2,525
Little Rock.....	12	684	524	159	1	1	4,879	1,839	3,681	698
North Little Rock.....	12	9	8	1	—	2	247	157	45	22
Pine Bluff.....	11	47	45	2	—	15	554	383	126	20
Texarkana.....	12	229	60	136	33	203	531	305	404	222



TABLE 6.—*Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926—Continued*

State and city	Total monthly reports received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
California.....	136	6,327	3,839	2,446	42	1,119	117,779	48,645	22,680	5,047
Fresno.....	6	80	59	17	4	87	1,341	733	346	151
Los Angeles (3).....	36	2,816	1,605	1,191	20	311	40,525	15,333	6,183	2,239
Oakland.....	12	792	428	364	—	34	11,781	3,639	3,328	588
San Diego.....	11	291	162	124	5	247	5,350	4,375	1,000	414
San Francisco (4).....	47	1,767	1,247	508	12	189	50,571	22,117	10,666	1,325
San Jose.....	12	44	30	13	1	9	509	273	229	22
Stockton.....	12	537	308	229	—	242	8,002	2,175	928	308
Colorado.....	60	632	252	364	16	528	18,500	2,472	1,351	1,884
Colorado Springs.....	12	26	12	14	—	16	645	118	80	50
Denver (2).....	24	418	195	222	1	374	11,544	1,666	944	1,545
Fort Collins.....	12	78	6	72	—	88	3,348	147	46	176
Pueblo.....	12	110	39	56	15	50	2,963	541	281	113
Connecticut.....	72	884	381	482	21	487	18,434	5,085	1,807	2,083
Bridgeport.....	12	137	84	53	—	34	4,079	1,005	321	91
Hartford.....	12	320	116	199	5	154	5,649	1,616	309	641
New Haven.....	12	148	70	78	—	64	6,181	1,661	658	153
New London.....	12	22	13	9	—	14	625	124	61	33
Stamford.....	12	213	76	121	16	207	1,109	364	412	1,137
Waterbury.....	12	44	22	22	—	14	791	315	46	28
Delaware.....	32	266	166	80	20	108	2,966	1,475	359	150
Dover.....	12	93	25	52	16	92	1,532	530	113	126
Wilmington (2).....	20	173	141	28	4	16	1,434	945	246	24
Florida.....	66	1,678	950	568	160	548	12,620	5,882	3,377	981
Alton.....	1	15	4	11	—	—	22	10	2	5
Arcadia.....	8	61	27	25	9	54	607	178	104	71
Fort Pierce.....	5	43	19	15	9	23	342	102	39	7
Jacksonville.....	11	198	198	—	—	166	1,093	943	783	—
Miami.....	11	734	283	327	124	83	4,649	2,945	817	100
Ocala.....	12	4	4	—	—	—	37	33	3	3
Perry.....	6	106	44	44	18	15	514	40	3	—
Tampa.....	12	517	371	146	—	207	5,356	1,631	1,626	795
Georgia.....	72	3,106	2,482	576	48	458	37,507	13,619	12,500	705
Atlanta.....	12	1,014	967	47	—	—	10,274	4,549	7,725	33
Augusta.....	12	223	86	126	11	9	13,922	1,224	1,667	389
Brunswick.....	12	49	46	3	—	25	404	192	181	31
Columbus.....	12	427	277	150	—	—	1,712	863	217	—
Macon.....	12	760	510	219	31	178	6,249	2,288	974	223
Savannah.....	12	633	596	31	6	246	4,946	4,503	1,736	29
Illinois.....	258	8,725	3,631	4,919	175	2,978	317,084	45,451	28,468	44,406
Alton.....	12	171	90	79	2	121	3,891	591	172	149
Cairo.....	12	126	95	31	—	134	1,982	1,162	219	6
Carlinville.....	9	75	35	35	5	108	638	202	330	* 433
Chicago (9).....	107	7,058	2,769	4,152	137	1,732	281,025	33,075	25,796	40,824
Decatur.....	12	164	96	68	—	7	3,861	1,318	240	601
East St. Louis.....	12	311	129	153	29	185	5,720	488	235	637
Herrin.....	12	84	52	31	1	87	899	781	137	57
Litchfield.....	12	38	14	24	—	4	2,280	211	44	272
Moline.....	5	31	12	19	—	30	842	521	57	31
Peoria.....	12	206	120	86	—	178	3,183	887	510	629
Princeton.....	12	4	1	3	—	—	43	—	1	7
Robinson.....	5	5	—	5	—	6	150	12	—	19
Rockford.....	12	57	20	37	—	41	1,605	486	120	112
Springfield.....	12	373	186	186	1	325	7,573	5,269	585	629
West Hammond.....	12	22	12	10	—	20	3,392	448	22	—

TABLE 6.—*Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926—Continued*

State and city	Total monthly re- port received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsphen- amin administered	Wassermann tests made	Microscopic exami- nations, gonococcus
		Total	Syphilis	Gonorrhea	Chaneroid					
<b>Indiana</b> .....	192	3,155	1,574	1,474	107	877	101,529	19,816	7,121	2,453
Anderson.....	12	117	34	83	-----	51	5,276	516	185	158
Columbus.....	12	28	15	13	-----	7	1,007	156	40	20
Elwood.....	12	42	17	25	-----	13	1,449	188	37	30
Evansville.....	12	645	314	319	12	181	15,356	4,316	1,013	354
Fort Wayne.....	12	194	94	97	3	88	2,315	650	284	345
Hammond.....	12	169	98	58	13	92	7,255	1,150	325	12
Indianapolis (2).....	24	709	340	332	37	22	40,395	1,760	2,422	533
Kokomo.....	12	108	56	52	-----	11	1,475	1,045	106	45
Madison.....	12	55	17	33	5	39	1,176	157	25	-----
Marion.....	12	47	26	21	-----	11	1,748	1,513	51	1
Muncie.....	12	235	112	89	34	199	2,842	1,554	396	229
Newcastle.....	12	24	17	7	-----	5	960	-----	69	-----
Richmond.....	12	35	32	3	-----	1	1,230	216	121	21
South Bend.....	12	273	160	112	1	66	8,698	4,144	916	328
Terre Haute.....	12	474	242	230	2	89	10,347	2,451	1,131	377
<b>Kansas</b> .....	60	476	259	215	2	234	10,568	2,738	1,631	937
Junction City.....	12	16	-----	16	-----	-----	-----	-----	-----	58
Kansas City (2).....	12	96	68	28	-----	27	808	218	93	20
Topeka.....	12	133	65	66	2	34	3,584	1,151	722	376
Wichita (2).....	24	231	126	105	-----	173	6,176	1,869	816	483
<b>Kentucky</b> .....	152	5,035	2,646	2,160	229	2,773	45,175	13,113	6,809	1,985
Ashland.....	11	169	114	55	-----	-----	4,193	2,286	312	547
Covington.....	12	189	82	107	-----	162	3,133	428	201	-----
Frankfort.....	12	1,174	614	560	-----	1,147	4,165	1,114	1,352	-----
Fulton and Hickman.....	9	47	37	10	-----	2	452	389	83	7
Georgetown.....	12	54	32	17	5	53	637	223	116	40
Henderson.....	7	19	19	-----	-----	2	500	221	48	-----
Lexington.....	12	757	516	231	10	905	9,907	2,624	2,691	835
Louisville.....	12	2,229	1,020	1,008	201	282	15,964	3,883	1,217	73
Maysville.....	8	70	29	40	1	48	946	285	156	91
Mount Sterling.....	4	4	2	2	-----	5	43	27	5	-----
Newport.....	10	123	42	69	12	91	2,518	445	237	271
Owensboro.....	8	40	34	6	-----	33	555	371	117	25
Paducah.....	9	53	43	10	-----	-----	318	252	60	23
Paintsville.....	10	41	24	17	-----	30	321	171	47	24
Somerset.....	5	5	4	1	-----	10	170	81	27	3
Winchester.....	11	61	34	27	-----	3	1,353	313	140	46
<b>Louisiana</b> .....	26	2,042	1,121	886	35	1,871	18,485	8,312	4,085	3,015
Monroe.....	2	115	100	15	-----	30	965	755	120	20
New Orleans.....	12	463	184	264	15	46	9,932	4,699	787	440
Shreveport.....	12	1,464	837	607	20	1,795	7,588	2,858	3,178	2,555
<b>Maine</b> .....	44	220	114	97	9	311	5,872	2,258	882	333
Bath.....	12	11	9	2	-----	-----	462	105	121	116
Calais.....	12	35	15	19	1	220	2,365	617	135	29
Portland (2).....	20	174	90	76	8	91	3,045	1,536	626	188
<b>Maryland</b> .....	160	2,508	1,063	1,311	134	1,519	52,430	14,599	3,810	3,254
Annapolis.....	12	188	61	123	4	224	1,865	582	103	127
Baltimore (4).....	48	1,646	716	808	122	893	32,720	9,501	2,893	1,462
Brunswick.....	3	24	-----	24	-----	4	222	17	11	17
Cambridge.....	8	43	27	15	1	6	210	113	61	2
Crisfield.....	12	88	28	60	-----	87	968	371	93	199
Cumberland.....	12	218	71	144	3	112	12,729	1,605	402	812
Easton.....	7	19	19	-----	-----	14	657	657	174	-----
Ellicott City.....	11	32	28	1	3	2	471	275	133	-----
Hagerstown.....	12	121	59	62	-----	91	1,607	864	254	618
Havre de Grace.....	3	16	1	14	1	19	2	2	16	-----
Hughesville.....	10	28	4	24	-----	22	290	40	28	1
Prince Frederick.....	3	4	-----	4	-----	2	-----	-----	-----	-----
Rockville.....	7	28	5	23	-----	6	138	58	28	2
Salisbury.....	12	53	44	9	-----	37	551	514	114	14

TABLE 6.—*Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926—Continued*

State and city	Total monthly reports received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
Michigan.....	152	7, 127	3, 873	3, 243	11	932	128, 578	21, 313	30, 888	28, 624
Battle Creek.....	12	72	47	25	-----	43	449	203	159	160
Detroit (4).....	46	6, 193	3, 289	2, 904	-----	567	112, 748	17, 761	26, 434	26, 651
Flint.....	12	181	112	66	3	14	3, 718	78	1, 040	521
Grand Rapids.....	12	98	58	39	1	30	1, 288	455	160	60
Highland Park.....	8	20	14	6	-----	11	225	60	33	15
Jackson.....	12	73	59	14	-----	64	2, 433	1, 217	747	32
Kalamazoo.....	12	58	25	28	5	35	1, 819	154	175	237
Lansing.....	12	158	114	44	-----	93	747	396	1, 630	159
Pontiac (2).....	14	215	110	103	2	7	3, 521	529	262	619
Saginaw.....	12	59	45	14	-----	68	1, 630	460	248	170
Minnesota.....	48	1, 198	501	695	2	704	30, 333	8, 618	2, 954	1, 761
Duluth.....	12	524	187	336	1	68	11, 215	2, 198	747	842
Minneapolis (2).....	24	323	150	173	-----	101	10, 509	3, 446	1, 142	251
St. Paul.....	12	351	164	186	1	535	8, 609	2, 974	1, 065	668
Mississippi.....	23	446	350	70	26	217	3, 258	2, 025	795	309
Laurel.....	11	223	186	24	13	130	1, 476	1, 194	604	43
Meridian.....	12	223	164	46	13	87	1, 782	831	191	266
Missouri.....	176	4, 329	2, 950	1, 260	119	495	86, 136	11, 136	7, 541	3, 608
Columbia.....	12	28	26	2	-----	13	374	139	91	24
Flat River.....	3	25	19	6	-----	1	54	32	22	8
Hannibal.....	12	23	7	14	2	5	206	44	16	9
Joplin.....	6	36	18	15	3	34	596	188	165	185
Kansas City (5).....	59	1, 751	1, 101	616	34	212	22, 914	6, 037	4, 710	1, 707
Sedalia.....	12	86	28	41	17	83	1, 003	35	120	129
Springfield.....	12	113	79	33	1	91	1, 822	439	221	116
St. Joseph.....	12	322	121	201	-----	2	3, 371	983	358	160
St. Louis (5).....	48	1, 945	1, 551	332	62	54	55, 796	3, 239	1, 838	1, 270
Montana.....	6	13	4	8	1	5	238	26	14	25
Great Falls.....	6	13	4	8	1	5	238	26	14	25
Nebraska.....	48	1, 026	498	518	10	413	32, 539	8, 181	4, 614	6, 274
Hastings.....	12	18	4	14	-----	13	573	34	14	248
Lincoln.....	12	306	100	205	1	106	15, 137	3, 473	1, 521	3, 685
Omaha (2).....	24	702	394	299	9	294	16, 829	4, 674	3, 079	2, 341
New Hampshire.....	41	135	77	58	-----	32	7, 686	1, 947	504	200
Concord.....	12	21	18	3	-----	-----	495	477	23	7
Dover.....	6	13	11	2	-----	-----	89	44	6	3
Manchester.....	12	77	30	47	-----	32	5, 809	1, 030	200	162
Nashua.....	11	24	18	6	-----	-----	1, 293	396	275	28
New Jersey.....	205	2, 143	1, 264	870	9	628	47, 878	11, 386	6, 242	3, 325
Bayonne.....	11	20	17	3	-----	23	700	335	119	23
Camden.....	11	34	34	-----	-----	-----	373	63	19	-----
Englewood.....	11	34	31	3	-----	-----	421	411	110	8
Greystone Park.....	11	63	40	23	-----	61	1, 460	1, 071	232	78
Jersey City.....	10	34	22	12	-----	2	1, 598	549	162	58
Long Branch.....	11	50	46	4	-----	3	777	331	202	30
Montclair.....	11	37	35	2	-----	-----	1, 631	1, 165	258	-----
Morristown.....	11	45	27	18	-----	9	323	-----	47	-----
Mount Holly.....	2	1	1	-----	-----	-----	-----	-----	-----	-----
Newark.....	11	1, 074	524	546	4	378	23, 892	3, 607	2, 110	2, 567
New Brunswick.....	9	56	34	21	1	28	749	437	88	15
Orange.....	11	167	109	57	1	12	3, 764	855	1, 798	234
Passaic.....	11	36	33	3	-----	2	792	307	145	4
Paterson (2).....	22	41	33	28	-----	-----	1, 896	487	124	-----
Plainfield.....	11	69	50	17	2	57	1, 539	371	110	15
Somerville.....	8	2	2	-----	-----	4	167	149	21	2
Spring Lake.....	11	38	38	-----	-----	8	355	259	55	-----
Trenton.....	11	322	196	125	1	36	6, 901	922	597	272
Weehawken.....	11	20	12	8	-----	3	540	67	45	19

TABLE 6.—*Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926—Continued*

State and city	Total monthly reports received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
New York.....	545	5,864	3,604	2,194	66	5,195	138,582	42,333	13,061	6,958
Albany (4).....	48	298	171	120	7	231	6,098	2,166	829	107
Amsterdam.....	12	50	34	16	—	25	2,298	808	81	20
Auburn.....	12	25	23	2	—	2	811	220	118	5
Beacon.....	11	9	9	—	—	16	195	122	42	2
Binghamton.....	12	92	79	13	—	71	5,441	1,485	386	33
Buffalo (2).....	18	1,943	1,243	661	39	1,823	39,660	6,553	2,995	3,887
Cohoes.....	12	40	9	29	2	37	496	100	28	—
Corning.....	11	28	20	7	1	22	485	169	38	7
Dunkirk.....	12	2	1	1	—	3	326	79	30	5
Elmira.....	12	115	77	38	—	45	2,972	1,344	226	40
Glen Falls.....	12	40	25	15	—	27	2,482	892	183	42
Gloversville.....	12	34	24	10	—	—	1,307	973	55	39
Hornell.....	11	16	16	—	—	41	464	90	65	3
Hudson.....	11	9	6	3	—	5	56	54	27	19
Ithaca.....	12	178	35	143	—	182	2,597	551	142	518
Jamestown.....	12	66	43	23	—	90	2,127	772	144	36
Little Falls.....	11	2	—	2	—	15	276	38	16	2
Middletown.....	11	100	74	26	—	106	1,945	634	—	—
Newburgh.....	12	12	7	5	—	1	297	35	12	2
New Rochelle.....	12	190	99	88	3	209	1,994	659	346	241
Niagara Falls.....	12	87	63	24	—	253	2,418	1,502	274	46
Olean.....	12	52	35	17	—	44	598	271	34	2
Oswego.....	12	46	34	12	—	26	2,624	1,668	82	31
Plattsburg.....	12	23	23	—	—	26	527	188	51	2
Port Chester.....	12	27	22	5	—	74	892	366	79	9
Poughkeepsie.....	12	45	31	14	—	80	1,167	534	133	102
Rochester (6).....	65	669	482	186	1	702	24,849	13,011	3,891	803
Rome.....	12	65	40	25	—	29	1,123	475	88	36
Salamanca.....	4	21	13	7	1	2	115	40	14	2
Saratoga.....	11	15	10	5	—	4	376	189	15	—
Schenectady.....	12	144	59	79	6	71	3,198	453	139	76
Syracuse (2).....	24	694	352	342	—	375	10,801	1,747	1,266	372
Troy.....	11	66	45	21	—	50	1,460	631	177	46
Utica.....	12	342	187	155	—	270	8,265	1,289	426	158
Watertown.....	12	54	45	9	—	31	703	298	54	8
Wellsville.....	11	22	22	—	—	8	174	125	13	4
White Plains.....	11	30	28	2	—	38	333	268	42	3
Yonkers.....	12	213	118	89	6	131	6,632	1,534	520	250
North Dakota.....	15	25	4	21	—	37	428	108	33	237
Grand Forks.....	3	1	—	1	—	1	52	24	4	8
Minot.....	12	24	4	20	—	36	376	84	29	229
Ohio.....	463	9,220	4,957	3,933	330	2,089	171,832	36,435	26,014	17,219
Akron.....	12	973	259	654	60	191	23,692	2,416	1,921	1,923
Athens.....	12	29	29	—	—	1	1,340	268	198	—
Canton.....	12	71	48	23	—	14	601	293	136	9
Chillicothe.....	12	11	11	—	—	7	77	77	5	—
Cincinnati (4).....	32	1,416	897	472	47	40	23,234	5,453	3,077	696
Cleveland (11).....	124	4,196	1,883	2,099	214	725	85,337	12,209	12,092	12,576
Columbus (5).....	59	890	593	295	2	646	11,575	3,015	3,305	877
Dayton (3).....	35	541	377	163	1	107	7,801	4,262	2,029	258
East Liverpool.....	12	136	50	83	3	108	2,047	480	217	394
Hamilton.....	11	44	44	—	—	33	370	353	100	29
Lakewood.....	12	5	1	4	—	—	92	91	27	24
Lima (2).....	24	25	24	1	—	2	1,594	293	79	11
Massillon.....	12	111	111	—	—	57	2,961	1,441	629	44
Portsmouth.....	11	101	101	—	—	72	1,739	870	176	—
Port Clinton.....	11	10	7	2	1	1	81	49	129	4
Springfield (2).....	24	137	92	45	—	64	1,583	747	242	263
Toledo (2).....	24	286	213	71	2	7	3,431	2,014	635	96
Youngstown (2).....	24	238	217	21	—	14	4,277	2,104	1,017	15
Oregon.....	11	333	200	133	—	—	5,423	1,451	732	734
Portland.....	11	333	200	133	—	—	5,423	1,451	732	734



TABLE 6.—*Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926—Continued*

State and city	Total monthly reports received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
Pennsylvania	486	4, 703	2, 440	2, 191	72	3, 346	80, 149	24, 815	10, 571	4, 627
Allentown	12	256	133	123	—	46	5, 556	2, 361	1, 293	256
Altoona	12	171	114	57	—	126	3, 073	1, 078	135	171
Beaver Falls	12	95	55	35	5	17	741	349	78	90
Bedford	12	27	14	13	—	21	448	175	64	27
Bethlehem	12	118	111	7	—	22	1, 836	1, 155	343	115
Butler	12	31	24	7	—	18	413	153	121	31
Carlisle	10	16	16	—	—	—	395	85	48	16
Chambersburg	12	51	25	24	2	19	1, 260	539	51	49
Clearfield	12	34	34	—	—	—	194	—	34	34
Coatesville	10	51	26	22	3	15	590	189	101	48
Connellsville	11	54	39	15	—	—	768	333	132	55
Du Bois	12	56	45	11	—	62	1, 628	854	420	58
Easton	12	40	14	24	2	41	468	97	102	38
Erie	12	198	114	84	—	244	2, 990	958	654	198
Greensburg	12	95	72	16	7	87	942	343	308	88
Hazleton	12	42	15	26	1	41	1, 423	114	128	41
Huntingdon	12	47	24	20	3	9	352	131	85	44
Johnstown	12	195	92	101	2	156	1, 787	706	310	192
Lancaster (2)	24	70	43	27	—	11	792	272	168	70
Lebanon	12	25	22	3	—	6	483	268	33	24
Lewistown	9	30	17	13	—	1	373	204	71	30
McKeesport	11	125	52	62	11	57	2, 624	682	191	114
Meadville	4	2	—	2	—	—	66	32	18	2
Mifflintown	4	2	—	2	—	—	31	4	2	2
New Castle	12	68	50	18	—	68	518	300	82	68
Norristown	12	33	28	5	—	11	949	549	183	33
Philadelphia	12	348	195	151	2	336	9, 006	2, 510	941	346
Pittsburgh	12	680	360	313	7	554	8, 180	2, 735	713	671
Pottsville	12	42	35	7	—	1	688	414	20	42
Reading	12	297	93	196	8	327	5, 744	—	—	289
Rochester	11	36	32	4	—	4	326	223	37	36
Scranton	12	325	55	262	8	296	6, 322	961	865	317
Shamokin	12	62	33	29	—	19	1, 323	377	103	60
Sharon	12	46	44	1	1	10	859	433	60	45
Stroudsburg	10	26	13	13	—	1	273	87	46	26
Sunbury	11	104	62	42	—	50	1, 881	378	121	105
Tunkhannock	12	6	3	3	—	17	67	17	20	6
Washington	12	102	50	46	6	74	1, 017	377	82	96
West Chester	11	38	23	15	—	—	408	50	380	38
Wilkes-Barre (2)	24	499	155	340	4	535	11, 907	3, 579	1, 815	496
York	12	160	108	52	—	43	1, 448	743	213	160
Rhode Island	76	636	351	285	—	91	13, 859	6, 043	5, 695	4, 783
Arctic	4	4	4	—	—	—	15	—	17	—
Newport	12	23	20	3	—	12	341	194	19	5
Pawtucket	12	49	29	20	—	18	2, 524	549	188	69
Providence (3)	36	541	282	259	—	59	10, 714	5, 075	5, 417	4, 689
Woonsocket	12	19	16	3	—	2	265	225	54	20
South Carolina	6	513	209	298	6	593	7, 347	1, 249	183	1, 709
Orangeburg	3	99	36	63	—	354	286	120	28	—
Spartanburg	3	414	173	235	6	239	7, 061	1, 129	155	1, 709
South Dakota	8	10	4	6	—	10	245	96	37	48
Aberdeen	4	7	2	5	—	1	136	19	30	19
Sioux Falls	4	3	2	1	—	9	109	77	7	29
Tennessee	53	4, 090	2, 397	1, 224	469	2, 335	59, 475	18, 053	21, 990	4, 923
Chattanooga	2	11	7	3	1	3	69	42	18	5
Dyersburg	1	6	4	2	—	2	26	15	11	—
Franklin	2	5	5	—	—	2	26	26	13	—
Knoxville	12	787	380	373	34	272	19, 803	3, 602	1, 311	1, 361
Memphis	12	1, 848	1, 439	327	82	805	23, 272	11, 166	19, 118	1, 397
Nashville (2)	18	1, 411	546	514	351	1, 248	16, 085	3, 104	1, 475	2, 149
Sevierville	2	6	4	1	1	2	45	21	9	5
Trenton	2	10	8	2	—	—	107	59	30	3
Union City	2	6	4	2	—	1	42	18	5	3

TABLE 6.—*Report of clinics reporting to State boards of health, July 1, 1925, to June 30, 1926—Continued*

State and city	Total monthly reports received	Patients admitted				Patients discharged as noninfectious	Treatments given	Doses of arsphenamine administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
Texas.....	40	2,850	1,650	908	292	1,759	42,346	11,697	7,245	12,032
Dallas.....	11	56	51	5	—	4	875	862	1,109	20
El Paso.....	7	270	157	103	10	206	6,235	1,022	775	681
Houston.....	11	1,837	1,069	506	262	1,494	18,963	4,688	3,961	3,167
San Antonio.....	11	687	373	294	20	55	16,273	5,125	1,400	8,164
Vermont.....	24	35	29	6	—	22	601	378	213	55
Barre.....	7	4	3	1	—	—	133	38	45	1
Burlington (2).....	10	20	15	5	—	7	218	144	105	52
Rutland.....	7	11	11	—	—	15	250	196	63	2
Virginia.....	95	2,255	1,639	565	51	794	20,678	11,865	10,605	3,105
Charlottesville.....	12	260	260	—	—	—	2,100	2,100	5,367	—
Danville.....	12	56	51	5	—	18	586	444	183	8
Lynchburg.....	12	198	73	93	32	261	638	638	240	347
Newport News.....	12	87	78	9	—	79	3,928	1,478	425	222
Norfolk.....	3	123	95	28	—	106	1,245	399	523	253
Norton.....	9	76	59	17	—	88	1,510	653	235	27
Petersburg.....	12	311	255	52	4	26	3,377	2,328	732	123
Richmond.....	12	1,028	675	338	15	60	6,269	3,240	2,748	2,125
Roanoke.....	11	116	98	23	—	156	1,025	585	152	—
Washington.....	36	1,161	564	586	11	538	21,029	2,848	6,985	7,733
Seattle.....	12	809	387	411	11	210	9,520	1,403	5,555	5,197
Spokane.....	12	286	145	141	—	299	10,110	1,161	1,265	2,105
Tacoma.....	12	66	32	34	—	29	1,399	284	165	431
West Virginia.....	112	1,636	1,026	544	66	466	18,093	7,206	3,227	1,888
Alderson.....	5	10	10	—	—	—	118	98	24	6
Bluefield.....	7	15	12	2	1	15	150	82	30	24
Charleston.....	12	619	388	220	11	113	4,273	1,180	1,092	579
Clarksburg.....	12	108	86	22	—	151	3,762	1,617	256	401
Grafton.....	1	1	—	1	—	10	66	17	4	13
Huntington.....	12	271	176	84	11	16	3,765	2,017	738	334
Kingwood.....	11	13	7	6	—	10	137	117	12	23
Logan.....	12	285	159	84	42	123	2,048	456	493	91
Martinsburg.....	3	20	8	12	—	16	97	32	10	28
Moundsville.....	6	79	45	34	—	—	—	—	—	—
Parkersburg.....	7	7	5	1	1	1	165	136	25	7
Richwood.....	12	11	11	—	—	10	274	274	20	—
Wheeling.....	12	197	119	78	—	1	3,238	1,180	523	382
Wisconsin.....	156	1,521	799	714	8	306	13,639	6,472	10,158	5,163
Beloit.....	12	52	22	30	—	36	868	327	40	4
Green Bay.....	12	14	10	4	—	1	77	43	27	10
Janesville.....	12	37	9	28	—	7	592	24	93	99
Kenosha.....	12	27	17	10	—	21	223	140	260	90
La Crosse.....	12	80	25	55	—	18	1,187	187	254	563
Madison.....	12	110	36	74	—	25	1,548	394	216	214
Millwaukee (3).....	36	1,049	614	427	8	108	6,655	4,660	8,758	3,655
Oshkosh.....	12	25	14	11	—	15	517	224	98	102
Racine.....	12	49	21	28	—	39	353	173	160	112
Superior.....	12	37	19	18	—	4	1,112	223	163	122
Wausau.....	12	41	12	29	—	32	507	77	89	192
Wyoming.....	6	10	4	6	—	4	319	93	23	18
Casper.....	6	10	4	6	—	4	319	93	23	18

TABLE 7.—*States ranked according to the monthly and daily new admissions per clinic, July 1, 1925, to June 30, 1926*

Rank	State	Monthly average new admissions per clinic	Daily average new admissions per clinic	Rank	State	Monthly average new admissions per clinic	Daily average new admissions per clinic
	United States..	22.9	0.8	20	Mississippi.....	19.4	0.6
1	South Carolina.....	85.5	2.9	21	Indiana.....	16.4	.5
2	Louisiana.....	78.5	2.6	22	Maryland.....	15.7	.5
3	Tennessee.....	77.2	2.6	23	West Virginia.....	14.6	.5
4	Texas.....	71.3	2.4	24	Connecticut.....	12.3	.4
5	Alabama.....	63.7	2.1	25	New York.....	10.8	.4
6	Michigan.....	46.9	1.6	26	Colorado.....	10.5	.4
7	California.....	46.5	1.6	27	New Jersey.....	10.5	.3
8	Arkansas.....	46.2	1.5	28	Wisconsin.....	9.8	.3
9	Georgia.....	43.1	1.4	29	Pennsylvania.....	9.7	.3
10	Illinois.....	33.8	1.1	30	Rhode Island.....	8.4	.3
11	Kentucky.....	33.1	1.1	31	Delaware.....	8.3	.3
12	Washington.....	32.3	1.1	32	Kansas.....	7.9	.3
13	Oregon.....	30.3	1.0	33	Maine.....	5.0	.2
14	Florida.....	25.4	.8	34	New Hampshire.....	3.3	.1
15	Minnesota.....	25.0	.8	35	Montana.....	2.2	.1
16	Missouri.....	24.6	.8	36	North Dakota.....	1.7	.1
17	Virginia.....	23.7	.8	37	Wyoming.....	1.7	.1
18	Nebraska.....	21.4	.7	38	Vermont.....	1.5	.1
19	Ohio.....	19.9	.7	39	South Dakota.....	1.3	.1

NOTE.—No clinic reports from Arizona, Idaho, and Massachusetts. Iowa, North Carolina, Oklahoma, and Utah did not report in 1926.

TABLE 8.—*State report of doses of arsphenamin (or similar product) administered, July 1, 1925, to June 30, 1926*

State	Doses administered	State	Doses administered
United States .....	651,785	Montana <sup>3</sup> .....	21
Alabama.....	47,384	Nebraska.....	9,602
Arizona <sup>1</sup> .....		Nevada <sup>1</sup> .....	
Arkansas.....	16,250	New Hampshire.....	1,957
California.....	55,096	New Jersey <sup>2</sup> .....	12,804
Colorado.....	2,472	New Mexico.....	
Connecticut.....	16,917	New York.....	43,451
Delaware.....	1,488	North Carolina <sup>1</sup> .....	
District of Columbia <sup>1</sup> .....		North Dakota.....	108
Florida.....	5,882	Ohio.....	44,601
Georgia.....	35,104	Oklahoma <sup>1</sup> .....	
Idaho <sup>2</sup> .....	614	Oregon <sup>2</sup> .....	1,512
Illinois.....	48,761	Pennsylvania.....	26,353
Indiana.....	24,701	Rhode Island.....	6,406
Iowa <sup>1</sup> .....		South Carolina <sup>4</sup> .....	2,125
Kansas.....	5,802	South Dakota.....	96
Kentucky.....	14,462	Tennessee.....	18,053
Louisiana.....	19,944	Texas <sup>2</sup> .....	20,446
Maine.....	2,353	Utah <sup>1</sup> .....	
Maryland.....	14,987	Vermont <sup>5</sup> .....	378
Massachusetts <sup>2</sup> .....	50,064	Virginia.....	11,933
Michigan.....	21,919	Washington.....	4,563
Minnesota.....	8,618	West Virginia.....	7,248
Mississippi.....	14,487	Wisconsin.....	6,472
Missouri.....	26,258	Wyoming <sup>3</sup> .....	93

<sup>1</sup> Not reporting.

<sup>2</sup> For 11 months only.

<sup>3</sup> For 6 months only.

<sup>4</sup> For 3 months only.

<sup>5</sup> For 7 months only.

TABLE 9.—*Report of 33 correctional and penal institutions, 1926*

Patients admitted:	
Syphilis.....	3, 517
Gonorrhea.....	4, 063
Chancroid.....	133
Total.....	7, 713
Patients discharged as noninfectious.....	
Treatments given.....	4, 301
Doses of arsphenamin administered.....	276, 084
Wassermann tests made.....	24, 555
Microscopic examinations for gonococcus infection.....	45, 139
	8, 766

TABLE 10.—*Statistical summary of activities in the control of venereal diseases for the fiscal years 1925 and 1926*

	1926	1925
<i>Medical activities</i>		
A. Cases of venereal diseases reported to State boards of health:		
I. Syphilis.....	215, 547	<sup>1</sup> 201, 692
II. Gonorrhea.....	166, 655	<sup>1</sup> 166, 208
III. Chancroid.....	7, 029	<sup>1</sup> 6, 742
Total.....	389, 231	1374, 642
B. Doses of arsphenamin (or similar product) distributed by State boards of health.....	651, 785	683, 591
C. Clinics:		
I. Clinics established during the year.....	23	34
II. Clinics reporting to State boards of health.....	416	495
III. Reports from clinics—		
a. Patients admitted.....	100, 776	110, 372
b. Patients discharged as noninfectious.....	44, 329	47, 828
c. Treatments given.....	1, 881, 380	2, 088, 494
d. Wassermann tests made.....	291, 803	300, 362
e. Microscopic examinations for gonococcus infection.....	188, 674	203, 512
D. Requests for medical information received by the Public Health Service.....	640	658
<i>Educational activities</i>		
A. Pamphlets:		
I. Requests for pamphlets received by the—		
a. Public Health Service.....	12, 235	11, 862
b. State boards of health from—		
1. Public Health Service for compliance.....	9, 986	9, 334
2. The public.....	28, 891	29, 801
Total.....	38, 877	39, 135
c. Gross total requests for pamphlets received.....	51, 112	50, 997
Minus requests received by State boards of health from the Public Health Service.....	9, 986	9, 334
d. Net total requests for pamphlets received.....	41, 126	41, 663
II. Pamphlets distributed—		
a. By the Public Health Service to—		
1. State boards of health.....	4, 711	29, 208
2. Others.....	41, 303	29, 357
Total.....	46, 014	58, 565
b. By State boards of health.....	969, 592	971, 003
c. Gross total pamphlets distributed.....	1, 015, 606	1, 029, 568
Minus pamphlets distributed by the Public Health Service to State boards of health.....	4, 711	29, 208
d. Net total pamphlets distributed.....	1, 010, 895	1, 000, 360
III. Pamphlets and placards purchased and reprinted by State boards of health.....	731, 044	784, 560
IV. Educational venereal disease pamphlets issued by the Public Health Service.....	2	4
V. Revisions of venereal disease pamphlets issued by the Public Health Service.....	1	<sup>2</sup> 1

<sup>1</sup> Changed from previously published 1925 figures because of additional data received after publication of the 1925 annual report.<sup>2</sup> National Negro Health Week Bulletin, 1925 edition.



TABLE 10.—*Statistical summary of activities in the control of venereal diseases for the fiscal years 1925 and 1926—Continued*

	1926	1925
<i>Educational activities—Continued</i>		
B. Lectures and addresses:		
I. Lectures and addresses reported by the—		
a. Public Health Service.....	134	230
b. State boards of health.....	4,133	4,779
Total.....	4,267	5,009
II. Average attendance reported by the—		
a. Public Health Service.....	137	158
b. State boards of health.....	109	111
Average attendance at total lectures.....	110	113
III. Lectures at which exhibit material was used, reported by—		
a. Public Health Service.....	72	135
b. State boards of health.....	391	602
Total.....	463	737
C. Exhibits and lantern slides:		
I. Exhibits and lantern slide sets loaned by the Public Health Service to—		
a. State boards of health.....	14	78
b. Public Health Service field officers.....	2	22
c. Others.....	55	59
Total.....	71	159
II. Exhibits and lantern slide sets purchased and borrowed by State boards of health.....	97	98
III. Exhibit and lantern slide showings reported by State boards of health.....	778	742
IV. Average attendance reported by State boards of health.....	252	473
D. Motion picture films and strip films:		
I. Motion picture films loaned by the Public Health Service to—		
a. State boards of health.....	2	8
b. Public Health Service field officers.....	—	4
c. Others.....	7	7
Total.....	9	19
II. Motion picture films purchased and borrowed by State boards of health..	35	19
III. Motion picture showings reported by State boards of health.....	404	643
IV. Average attendance reported by State boards of health.....	202	221
V. Strip films loaned by the Public Health Service to State boards of health..	405	—
E. Publicity material, Public Health Service:		
I. Articles furnished magazines.....	25	33

## DIVISION OF PERSONNEL AND ACCOUNTS

In charge of Asst. Surg. Gen. J. W. KERR

In order to conform to requirements of the President with respect to economy in expenditures, special attention has been paid during the year to office procedure as relates to personnel and accounts. This has been improved wherever practicable. Since practically all matters of personnel and accounts relating to the care of ex-service men and women have now been adjusted with the Veterans' Bureau following the transfer of this function to that bureau, certain changes of procedure naturally followed. The remaining records, pertaining to personnel especially, have been corrected and the methods of keeping these records stabilized. While it is impracticable fully to apply ordinary business methods in Government procedure—there are too many legislative and administrative restrictions to permit this—progress has been made in the simplification of the records and the methods of keeping them. Reductions of expenditures brought about in this way have been in large measure offset, however, by additional duties and responsibilities imposed by law on the service.

The extension to continental European ports of the medical examination of intending emigrants, in connection with the granting of consular visas, has caused a heavy draft on the number of commissioned medical officers of the regular corps heretofore available for other service activities in the United States. Since the inception of this work, at ports of Great Britain and the Irish Free State, in August, 1925, a total of 28 officers has been ordered to various points in Europe for duty. The practical value of making these medical examinations before the granting of visas has been demonstrated to the satisfaction of the State and Labor Departments and Immigration Service and Public Health Service officials during the past year. The necessity for selecting medical officers with the requisite experience, especially in mental examinations, has added to the personnel problems of the bureau. Congress has recognized the situation by authorizing 10 additional officers to replace those sent to Great Britain early in the year.

When it was decided that on account of the success of the medical examinations in Great Britain they should be extended to countries of continental Europe, provision was also made in a deficiency appropriation of July 3, 1926, in amount \$36,198, to supplement the appropriation, "Pay of personnel, etc., 1926," for 15 additional medical officers. Every effort has been made to recruit these officers and assign them to duty at regular stations in the United States and thus

relieve experienced commissioned officers for the inauguration of the medical examinations of intending aliens at continental ports. The appropriation act for 1927 had been passed, however, without provision for the inauguration of this work. This will necessitate, therefore, a deficiency appropriation for 1927, the estimate for which has been prepared. It is pertinent here to state that at the present time more than 25 per cent of the commissioned officers of the regular corps on active duty are engaged in foreign service, either in connection with immigration or quarantine activities.

An act approved May 8, 1926, provided that the pay of retired officers who had been retired on or before June 30, 1922, should not be less than that provided for officers of equal rank and length of service retired subsequent to that date. The pay of 14 officers of the service on permanent waiting orders was increased by the passage of this act from the date of its passage.

On account of the additional laws or modification of laws pertaining to the service and because of changes of procedure previously referred to, the regulations for the Government of the United States Public Health Service were thoroughly revised during the year and approved by the President February 9, 1926. The new regulations became effective April 1, 1926.

During the year the property accounting regulations have been rewritten and made uniform for all stations. Surplus property at stations has been made available to other stations, and transfers effected to the stations where most needed. In addition, quantities of surplus property, much of which originated from surplus stocks of the War Department, have been transferred to other Government departments and establishments. All unserviceable property has been inspected and sold whenever it had a sale value. Property of the service is all accounted for and complete records kept from the time it is acquired until finally disposed of.

The administrative and clerical work of this division in the bureau has perhaps reached a greater volume, in proportion to the number of persons employed therein, than at any time in the past. Much of this work is due to the installation and operation of record-keeping systems necessitated by requirements of the General Accounting Office. The insistence of that office on changes in procedure in conformity with its interpretation of the law has required modifications of methods in the handling of both personnel and accounting records which have for many years proved efficient and economical. The inauguration of certain new standard forms, while perhaps desirable from an accounting standpoint, has in numerous instances greatly increased the clerical work incidental to their use. There can be no doubt that further detailed work of this kind will require the employment of additional clerical personnel. The additional clerical work imposed is also beginning to result in requests for additional clerical personnel at the larger field stations.

Early in the fiscal year (July 16, 1925) the Comptroller General rendered a decision in connection with the compensation of certain employees in the Department of Commerce and the Department of the Interior to the effect that the furnishing of any allowances in the nature of quarters, subsistence, laundering, etc., to civil employees was contrary to law, on the theory that salaries had been adjusted by the heads of departments and establishments under the act of De-

ember 6, 1924, to correspond as nearly as might be practicable to the rates of pay provided for departmental employees by the classification act of 1922; that such salaries became thereupon "fixed by law"; and that the furnishing of additional allowances in kind therefore constituted a violation of section 1765, Revised Statutes. The decision stated that in view of the long-standing practice, no objection would be raised to furnishing such allowances prior to June 30, 1926, after which time, unless express statutory authority had been secured, the practice must be discontinued.

Since a large proportion of Public Health Service employees in the field are furnished quarters, subsistence, and laundering, a letter was addressed to the Comptroller General by the Secretary of the Treasury on July 22, 1925, setting forth the effect of his decision on the Public Health Service personnel, and explaining that for many years it had been customary under the regulations to furnish employees whose presence on the station was necessary to its operation with quarters, subsistence, and laundering. It was further stated that the value of such allowances had been considered in adjusting the cash pay of such employees, and that the allowances were always specified in the recommendation for appointment, thus constituting a part of the contract of employment.

In response to this letter a reconsideration of the decision, dated August 31, 1925, was given. The situation with regard to Public Health Service personnel was given recognition, and it was stated that the existing procedure could continue throughout the fiscal year undisturbed. The decision that express statutory authority would be required for its continuance after June 30, 1926, was reiterated, and a further requirement was added that the value of all allowances furnished in kind should be shown on pay rolls and the retirement deduction (then 2½ per cent) should be calculated on the added value of allowances and cash compensation. Beginning with the month of October this requirement was carried out, the value of allowances being fixed at specified rates for various employees by the Secretary of the Treasury.

The necessity of furnishing allowances in kind in the various field services of the Government was promptly recognized by Congress, and the act of March 2, 1926, making appropriations for the Treasury and Post Office Departments for the fiscal year 1927 contained the following language:

The head of an executive department or independent establishment, where in his judgment conditions of employment require it, may continue to furnish civilians employed in the field service with quarters, heat, light, household equipment, subsistence, and laundry service; and appropriations for the fiscal year 1927 of the character heretofore used for such purposes are hereby made available therefor: *Provided*, That the reasonable value of such allowances shall be determined and considered as part of the compensation in fixing the salary rate of such civilians.

Another decision of the Comptroller General, relating to the transportation of the personal effects of officers and employees on permanent change of station, also necessitated relief by congressional action. The decision relating to the cost of transporting the household goods and other personal effects of employees, when ordered to make permanent change of station, was rendered originally in the case of certain field employees of the Department of the Interior, under date of March 28, 1925. (4 Comp. Gen. 818.)



Although the payment of such expenses had been authorized for commissioned officers, scientific personnel, pharmacists, and administrative assistants for years under presidential regulations, the bureau received verbal notice from the General Accounting Office that unless express legal authority for such expenditures were secured by June 30, 1926, they would no longer be allowed. Accordingly, in connection with the 1927 estimates, request was made for language in the appropriation which would protect those employees already receiving the allowance, by regulation, on change of station. The Treasury Department approved the language submitted, but the Bureau of the Budget declined to include either scientific personnel or administrative assistants in the wording of the estimates as transmitted to Congress. These two classes of field personnel, who are appointed for general field duty and are subject to change of station, are thus subjected to an expense which was formerly defrayed by the Government and which they doubtless considered in connection with the compensation of the positions when many of them entered the service. Consideration of this fact will necessarily act as a deterrent to the bureau in ordering changes of station in future even when the best interests of field work would be served thereby.

#### PUBLIC HEALTH DISTRICTS

During the year Senior Surg. E. K. Sprague has continued to serve as acting director of district No. 1, in the absence of Asst. Surg. Gen. Rupert Blue, who has remained on special duty in connection with the eradication of plague in California. Doctor Sprague has discharged the duties of director in addition to serving as medical officer in charge of United States Marine Hospital No. 70 for a part of the year, and later as chief medical officer at Ellis Island, N. Y.

The office of the director was moved from 370 Seventh Avenue to 45 Broadway during the year. The latter building, Government owned and under the control of the United States Shipping Board, affords increased accommodations at a considerable reduction in cost of rental, the latter being prorated on an actual cost basis among the various Government activities housed.

Under the director in district No. 1 Chief Pharmacist W. L. Stearns has been in immediate charge of the work of assistant to the coordinator for supply, a function which the office of the district director has for several years discharged in the New York area. Mr. Stearns has also acted as special disbursing agent.

The solicitation of proposals for furnishing subsistence supplies for stations in the New York City area has been conducted on a monthly basis, and supplies other than subsistence have been solicited quarterly. United States Veterans' Hospital No. 81, in New York, has utilized the subsistence proposals for securing supplies, provision being made in the solicitation of the proposals for this purpose, and both services thus securing the advantage of increased quantity purchasing. Coordinated purchasing for all Public Health Service stations in the area has again proved satisfactory and economical. The inspection of supplies, conducted by inspectors detailed from the meat inspection division of the local office of the Bureau of Animal Industry and the Bureau of Agricultural Economics, has been productive of good results and has insured the quality of all

supplies such as meats, poultry, fish, and dairy products delivered on contracts.

The office of the district director in New York has also acted on 133 requisitions submitted by the Bureau of Supply in Washington and by Public Health Service stations in the New York area, preparing the specifications and soliciting the proposals for the supplies requisitioned.

Surg. B. S. Warren has continued as director of district No. 2, with headquarters at Baltimore, Md. During the year inspections were made of all service stations and activities in the district, including marine hospitals at Baltimore, Md.; Pittsburgh, Pa.; Norfolk, Va.; Louisville, Ky.; and Memphis, Tenn. Twenty-two relief stations, the Public Health Service supply depot at Perry Point, Md., and the United States Coast Guard supply depot at Arundel Cove, Md., were visited, as were 8 quarantine stations, 5 immigration stations, the service trachoma hospital at Knoxville, Tenn., and 4 field stations of the Division of Scientific Research.

Numerous recommendations were made with a view to consolidation and coordination of the work at stations visited, many of which have resulted in substantial economies. During the year the relief station maintained at Lee Hall, Va., to render service to men on board the laid-up fleet, was discontinued on recommendation of the district director.

Fourteen physicians, who furnish relief to officers and men of the Coast Guard, under contract arrangements, were visited during the year. Charges against an employee at the Memphis (Tenn.) Marine Hospital, and apparent shortages in the delivery of ice to the Hygienic Laboratory at Washington were also investigated and report made thereon.

The visiting of all field stations by the director of the second district has been productive of excellent results, especially in the conduct of the smaller stations which have been brought into closer contact with the bureau, and which have been rendering an improved service.

Senior Surg. C. C. Pierce has served throughout the year as director of district No. 3, with headquarters at Chicago, Ill. During the year inspections were made of 11 relief stations, 4 immigration stations, and 3 contract stations for the relief of Coast Guard personnel. The Marine Hospitals at St. Louis, Evansville, Ind., Cleveland, and Chicago were also inspected, and the disposal of unserviceable property at these hospitals arranged for. The trachoma hospital at Eveleth, Minn., was also visited. Conferences with service officers regarding the conduct of the work were held at all of these stations.

The director served on four entrance-examination boards, three immigration boards, two boards for the examination of reserve officers, and as chairman of a board to examine proposed sites for a new marine hospital at Detroit, Mich.

Numerous meetings of associations for the promotion of public health in Chicago and elsewhere in the third district were attended during the year. These included a meeting of the health officers of Illinois, at which an address was given on "Control methods of smallpox"; four meetings of the Chicago Regional Planning Association, at which the director acted as chairman of the health sec-

tion; a meeting of the Cook County Health Association, where an address was made on "Practical application of public-health education"; a community health pageant at Ravenswood, Ill., where the director was principal speaker at a public meeting; and meetings of the Chicago Pneumonia Commission, the Chicago Social Hygiene Council, the Conference on Medical Education of the American Medical Association, and the annual meeting of the American Public Health Association in St. Louis, Mo.

Conferences were held with the State health officers of Wisconsin, Minnesota, Kansas, Indiana, Ohio, Kentucky, Missouri, South Dakota, and Iowa, and also upon several occasions with officials of the American Medical Association regarding public-health matters.

The director also served for a part of the year as president of the Chicago Federal Business Association, and on request of local authorities served as a member of the Chicago Civil Service Examining Board, holding examinations on technical subjects for positions in the Chicago Health Department. He assisted in the organization of a committee on health education and the school child, on request of the commissioner of health of Chicago.

On April 4, Senior Surgeon Pierce was ordered to Washington to assume charge of the preparation of the Public Health Service exhibit for the Sesquicentennial Exposition in Philadelphia. He was given entire supervision of the collection and preparation of exhibit material, models, etc., and arrangements for its shipment and installation. The completion of this duty occupied his entire time during the months of April, May, and June.

Throughout the year Surg. John McMullen has served as director of district No. 4, with headquarters at New Orleans, La. Until September 30, 1925, he was also in charge of the rodent-plague survey at New Orleans and other Gulf ports, conducted for the purpose of determining the extent of bubonic-plague infection among rats. On the latter date this work was successfully terminated.

During the year the marine hospitals at Mobile, Ala., Carville, La., and Key West, Fla., were visited and inspected. Eleven relief stations within the district were also visited, as well as the trachoma hospital at Russellville, Ark. In addition, 23 quarantine stations were visited and inspected. In a number of cases recommendations for the consolidation of relief and quarantine functions were made, which resulted in substantial economies.

On recommendation of the director the relief station maintained at Little Rock, Ark., and the quarantine station at Texas City, Tex., were discontinued. Rearrangement of personnel engaged in relief and quarantine work at Gulfport, Miss., effected a material reduction in expenditures.

A survey was made of property belonging to the War Department at Miami, Fla., with a view to the establishment of a quarantine station at that place, and marine hospital facilities when the present rapid growth of the city justifies it.

During the past winter the prevalence of smallpox in Florida resulted in the imposition of a quarantine against Florida traffic by the government of the Bahama Islands, and the director was sent to Florida to assist State health authorities in preventive measures so as to have the quarantine raised. A commission of three medical officers from Cuba visited the State and accompanied the director

through sections they desired to visit. They expressed themselves entirely satisfied with the work being done to prevent the spread of smallpox.

The director reports conditions on the Texas-Mexican border with regard to quarantine procedure and facilities as greatly improved.

The director represented the service at a conference on mosquito eradication held in New Orleans on October 14, 1925, and by invitation addressed the meeting of the Louisiana State Medical Association held at Monroe, La., last April, on "The activities of the United States Public Health Service in the South."

Senior Surg. J. C. Perry has served as director of district No. 5 throughout the fiscal year, with headquarters at San Francisco, Calif.

Inspection of all stations in the district was accomplished during the year, the larger stations being inspected twice. Four State institutions in which insane beneficiaries of the service are treated were also inspected. Complaints of beneficiaries at two service hospitals were investigated and reports made thereon. The district director also served as chairman of several boards convened for examination of officers for entrance and promotion and during the illness of the medical officer in charge assumed temporary charge of the San Francisco Marine Hospital.

Cooperation with State and local health authorities has been maintained and conferences held with county horticultural commissioners in California on the general problem of ground-squirrel eradication in relation to control of bubonic-plague infection. The director of the district was requested to serve on the committee of public health and sanitation of the regional planning commission, in cooperation with the State health officer of California and the city health officer of San Francisco.

Because of the smallpox situation in California, a survey was made to determine the practicability of the medical inspection and vaccination of crews taken to Alaska for work in the salmon canneries, and after correspondence with the bureau it was decided to undertake the physical examination and vaccination of this personnel. During the months of April and May 3,841 persons were examined and vaccinated, of which number 23 were rejected.

The smallpox situation in California also resulted in the certification and vaccination of all passengers destined for Hawaiian ports to meet the requirements of the Territorial health authorities. The district director had supervision of this work, and a uniform procedure was instituted at San Pedro, San Diego, Los Angeles, and San Francisco.

Senior Surg. G. M. Magruder has served as district director in district No. 6 throughout the year. All first, second, and third class relief stations and quarantine stations and subports were visited and inspected. The director reports a marked improvement in service procedure at quarantine stations. Numerous conferences were held with representatives of the Chamber of Commerce of Tacoma, Wash., regarding the advisability of inaugurating cyanide fumigation at that port as practiced at Seattle.

As in the fifth district, measures were taken to insure the certification and vaccination of persons destined for Alaska, particularly cannery employees. The commissioner of health of Alaska expressed



appreciation of the steps taken to prevent the introduction of small-pox which had prevailed on the Pacific coast.

Complaints from the Seattle Chamber of Commerce regarding the inconvenience to passengers from foreign ports resulting from quarantine inspection were investigated and the matter settled to the satisfaction of all concerned.

A survey of the medical inspection of immigrants was made, with a view to effecting a readjustment of salaries of acting assistant surgeons appointed for such work. A visit was also made to Port Angeles, Wash., with a view to effecting an advantageous rental arrangement with regard to the marine hospital reservation at that place, and an investigation was made as to the desirability of securing the United States Army reservation at Port Townsend, Wash., to be used for quarantine purposes in lieu of the present site. An inspection was also made of the customhouse at Port Townsend to ascertain the feasibility of its use as a marine hospital.

All of the duties of the district director in the sixth district have been carried on in addition to his detail as medical officer in charge of relief, quarantine, and immigration activities at Seattle.

#### COMMISSIONED MEDICAL OFFICERS

On July 1, 1925, the regular corps consisted of the Surgeon General, 4 assistant surgeons general at large, 21 senior surgeons, 132 surgeons, 20 passed assistant surgeons, and 23 assistant surgeons. Of this number, aggregating 201, 3 assistant surgeons general at large, 9 senior surgeons, 4 surgeons, and 3 passed assistant surgeons were on waiting orders. During the fiscal year the following changes occurred in the several grades: One surgeon was promoted to the grade of senior surgeon to fill a vacancy created by the placing on permanent waiting orders of 1 senior surgeon; 5 passed assistant surgeons were promoted to the grade of surgeon; 6 assistant surgeons were promoted to the grade of passed assistant surgeon; 19 candidates for appointment to the grade of assistant surgeon were successful in the entrance examination prescribed by law and the regulations of the service and were commissioned in that grade; 1 senior surgeon was placed on waiting orders because of physical disability; 2 passed assistant surgeons and 2 assistant surgeons resigned from the service; 1 assistant surgeon general, 1 surgeon on waiting orders, and 1 assistant surgeon died.

On June 30, 1926, after these changes had occurred, the regular corps consisted of the Surgeon General, 3 assistant surgeons general at large, 22 senior surgeons, 135 surgeons, 19 passed assistant surgeons, and 33 assistant surgeons. Of these 213 officers, 2 assistant surgeons general at large, 10 senior surgeons, 3 surgeons, and 3 passed assistant surgeons were on that date on waiting orders.

At the close of the fiscal year 1926, 7 surgeons were serving by detail as assistant surgeons general in charge of divisions of the bureau in accordance with the acts approved July 1, 1902, and July 9, 1918. One assistant surgeon general at large, 3 senior surgeons, and 2 surgeons were on duty as directors of the public health districts. One senior surgeon relieved a surgeon as medical officer in general charge of the enforcement in Europe of outgoing quarantine measures applicable to vessels, their crews, and emigrants destined to

ports in the United States and its dependencies, and assumed charge of the medical inspection in Europe of aliens in connection with the granting of consular visas. One surgeon was on detail as chief surgeon, Bureau of Mines, Department of Commerce, and 1 surgeon and 1 assistant surgeon were serving (the surgeon as medical director) on detail to the United States Employees' Compensation Commission.

#### RESERVE OFFICERS

On July 1, 1925, the reserve commissioned officers on active duty numbered 68, this number being composed of 1 assistant surgeon general, 1 senior surgeon, 4 surgeons, 3 dental surgeons, 15 passed assistant surgeons, 11 passed assistant dental surgeons, 28 assistant surgeons, and 5 assistant dental surgeons.

On July 1, 1926, after the changes had occurred, the number of reserve officers on active duty was 64, consisting of 1 assistant surgeon general, 4 surgeons, 4 dental surgeons, 11 passed assistant surgeons, 12 passed assistant dental surgeons, 26 assistant surgeons, and 6 assistant dental surgeons. There were on inactive status at the close of the fiscal year 6 assistant surgeons general, 43 senior surgeons, 101 surgeons, 2 dental surgeons, 49 passed assistant surgeons, 1 passed assistant dental surgeon, 43 assistant surgeons, and 1 assistant dental surgeon, the total number 246.

#### ATTENDING SPECIALISTS

On July 1, 1925, there were 156 attending specialists in the service, and during the year this number increased to 167, of which number 142 were consultants to marine hospitals, while 25 were available for call at second and third class relief stations.

#### ACTING ASSISTANT SURGEONS

On July 1, 1925, there were 496 acting assistant surgeons in the Public Health Service, and by July 1, 1926, this number had decreased by 13.

Of the 483 acting assistant surgeons on duty July 1, 1926, 102 were on duty at marine hospitals, 293 were engaged in immigration, relief, and maritime, border, insular, and foreign quarantine work, while 3 were engaged in the prevention of trachoma; 17 were on duty in connection with field investigations of public health and rural sanitation; 1 was engaged in national-park sanitation; 16 were on detail with the United States Coast Guard; 5 were serving with the Bureau of Mines by detail; and 46 were engaged in antivenereal-disease activities as part-time employees at nominal compensation. Seventeen of the 46 acting assistant surgeons engaged in antivenereal-disease activities held appointments as collaborating epidemiologists.

#### INTERNES

On July 1, 1925, there were 18 internes in the service, 4 of whom were students, and on July 1, 1926, there were 16. Internes are appointed locally under paragraphs 91 and 92 of service regulations for temporary periods of one year for duty at marine hospitals.

## CONTRACT DENTAL SURGEONS

On July 1, 1925, there were 29 contract dental surgeons employed at marine hospitals and second and third class relief stations. These part-time employees are appointed for local duty to receive fixed and uniform fees for dental work performed for service beneficiaries.

At the close of the fiscal year 8 contract dental surgeons were at marine hospitals and 23 were at second and third class relief stations.

## EPIDEMIOLOGISTS

The number of collaborating and assistant collaborating epidemiologists was increased slightly during the fiscal year. These employees are health officers or employees of State or local boards of health, who receive only nominal compensation from the Federal Government and who furnish the service with reports of communicable diseases received by State or local health organizations. During the year the number of collaborating epidemiologists remained at 42, these appointees being on duty in the different States, and the number of assistant collaborating epidemiologists was increased from 4,258 to 4,419. Eighteen of the collaborating epidemiologists also hold appointments as acting assistant surgeons under the division of venereal diseases.

## HYGIENIC LABORATORY

At the close of the fiscal year the personnel of the Hygienic Laboratory included, in addition to the director and assistant director, 3 chiefs of divisions, 9 surgeons, 2 passed assistant surgeons, 2 pharmacists, 5 special experts, 3 assistant pharmacologists, 4 chemists, 5 assistant chemists, 1 biochemist, 3 associate bacteriologists, 1 assistant bacteriologist, 1 bacteriological technician, 1 biologist, 1 associate biologist, 1 pathologist, 1 consultant pathologist, 1 consultant dermatologist, 1 artist, 16 other technical employees, 10 administrative and clerical employees, and 41 laboratory attendants and others.

## PHARMACISTS AND ADMINISTRATIVE ASSISTANTS

At the close of the fiscal year there were on duty 35 pharmacists and 17 administrative assistants in the service. The number of employees in this class of personnel remains practically the same. The resignations of 2 pharmacists and 2 administrative assistants during the year were responsible for the decrease from 37 to 35 and 19 to 17, respectively.

At the end of the fiscal year the pharmacists and administrative assistants were classed as follows:

Chief pharmacists.....	35
Administrative assistants, first class.....	5
Administrative assistants, second class.....	12

## BOARDS

During the fiscal year 1926, 153 boards were convened for various purposes throughout the service, as follows: Twenty-two for the medical examination of detained aliens, 11 for the examination of

commissioned officers to determine their fitness for promotion, 18 for the examination of applicants for commission in the grade of assistant surgeon in the regular corps, 6 for the examination of scientific personnel for promotion, 28 for the physical examination of Coast Guard officers for promotion, 5 for the physical examination of Coast Guard warrant officers for promotion, 37 for the physical examination of applicants for cadets in the Coast Guard, 17 for the physical examination of candidates for temporary commissions and temporary warrants in the Coast Guard, 1 to examine a Coast Guard officer to determine whether he should be ordered before a retiring board, 1 for inspecting service property, 1 for inspecting sites for a quarantine station, 1 to examine a pharmacist for promotion, 1 to consider disposition of property on quarantine hulk *Newark*, 1 to examine site for location of a station to combine all service activities in or around New Orleans, 1 to consider a revision of the interstate quarantine regulations, 1 to consider suitability of a reservation for a hospital site, and 1 for the examination of an alien patient in the trachoma hospital at Rolla, Mo.

The board appointed May 24, 1923, for the purpose of advising with the chairman of the Employees' Compensation Commission and assisting in the establishment of standards with respect to occupational diseases and claims for compensation has continued its service during the year. Opinions have been rendered by the board in 14 cases.

The accompanying statement shows the total personnel by classes and activities in the service on June 30, 1926. Attention should again be invited to the fact that collaborating epidemiologists and assistant collaborating epidemiologists, under which heading 4,442 persons are listed, are but nominal appointees, consisting almost entirely of officers or employees of State, county, and local boards of health who transmit to the Public Health Service reports of communicable diseases currently gathered by those health agencies.

#### ACCOUNTS SECTION

The accounts section of the division of personnel and accounts comprises a bookkeeping unit, voucher-audit unit, transportation-audit unit, and a pay-roll audit unit. The bookkeeping unit also handles all cost-accounting records for hospitals and relief stations and records of allotments and incumbrances in connection with appropriations.

As an appendix to this report there appears a tabulated statement showing appropriations, expenditures, and balances for the fiscal year 1926.



*Personnel of the Public Health Service, June 30, 1926*

	Medical and scientific																			
	Regular Corps								Reserve Corps					Acting assistant surgeon	At- tending specialist and consultant	Contract dental surgeon	In- terne	Scien- tific person- nel	As- sist- ant col- labo- rating epi- demi- ologist	Phar- ma- cist
	Surgeon general	As- sist- ant surgeon general at large	As- sist- ant surgeon general	Senior surgeon	Surgeon	Passed assistant surgeon	As- sist- ant surgeon	As- sist- ant surgeon general	Senior surgeon	Surgeon	Passed assistant surgeon	As- sist- ant surgeon								
BUREAU	1																			
Surgeon General's office	1																			
Chief clerk's office																				
Divisions			7		2			1		1								1		
General inspection service													5					1		
Detailed to other offices					5		1													
Total																				
FIELD																				
Coast Guard					1						4	1	16							
General inspection service																		1		
Perry Point, Md.		1		3	2															
Public-health districts						3														
Waiting orders		2		10	3															
Hospital division:																				
Marine Hospital No. 1, Baltimore, Md.					2							2	7	13				1		
Marine Hospital No. 2, Boston, Mass.				1	1		1					1	3	10				1		
Marine Hospital No. 3, Buffalo, N. Y.					1		1				2		2	10		2				
Marine Hospital No. 5, Chicago, Ill.					2		3				1	2	8	7				1		
Marine Hospital No. 6, Cleveland, Ohio					1					1	1		3	6		1		1		
Marine Hospital No. 7, Detroit, Mich.					1						1		5	9				1		
Marine Hospital No. 8, Evansville, Ind.					1								1	3	1			1		
Marine Hospital No. 9, Fort Stanton, N. Mex.					1		1			1			3							
Marine Hospital No. 10, Key West, Fla.					1									1	1			1		
Marine Hospital No. 11, Louisville, Ky.					1								3	8	2			1		
Marine Hospital No. 12, Memphis, Tenn.					1								2	4	1	1		1		
Marine Hospital No. 13, Mobile, Ala.					1		1					1	4	3				1		
Marine Hospital No. 14, New Orleans, La.					2		4				1	11	6	6		4		1		

Personnel of Public Health Service, June 30, 1926—Continued

294

	Medical and scientific																		
	Regular Corps							Reserve Corps					Acting assistant surgeon	Attending specialist and consultant	Contract dental surgeon	Interne	Scientific personnel	Assistant collaborating epidemiologist	Pharmacist
	Surgeon general	Assistant surgeon general at large	Assistant surgeon general	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Assistant surgeon general	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon							
FIELD—continued																			
Marine Hospital No. 15, Pittsburgh, Pa.				1									3	5					
Marine Hospital No. 16, Portland, Me.					1		1						1	10	1				
Marine Hospital No 17, Port Townsend, Wash.					2						1		2						
Marine Hospital No. 18, St. Louis, Mo.				1	1								4	14	1				
Marine Hospital No. 19, San Francisco, Calif.			1	1		1	2			1	4	3	4	5				2	
Marine Hospital No. 20, Savannah, Ga.				1	1						1		6	6					
Marine Hospital No. 21, Stapleton, N. Y.			1	2			1			1	1	7	6					2	
Marine Hospital No. 22, Vineyard Haven, Mass.				1	1									1	1				
Marine Hospital No. 43, Ellis Island, N. Y.			1	1			7						5	1		7			
Marine Hospital No. 66, Carville, La.													5	4					
Marine Hospital No. 70, Hudson St., N. Y.					3					1	3		14	12		1		1	
Marine Hospital No. 82, Norfolk, Va.				2			1			2	2	3	5	4				2	
Total hospitals																			
Relief stations:																			
Second class				2	5						2	1	19	20	10			1	
Third class													87	3	13				
Miscellaneous														2					
Total relief stations																			
Foreign quarantine division:																			
Baltimore, Md.					1								1						
Boston, Mass.					1		1						4					1	
Ellis Island, N. Y. (immigration)					5								14						
El Paso, Tex.					1								2						
Galveston, Tex.				1									1						
Fort Monroe, Va.					1								1						

Laredo, Tex.					1										2						
Marcus Hook, Pa.					1										2						
New Orleans, La.					4		1								4						2
Rosebank, N. Y.					4										10						
San Francisco, Calif. (immigration and quarantine)					3		1								2						
San Juan, P. R.					1										2						1
Foreign ports.				1	23		10		4						58						
All others.					5										84						
Total.																					
Domestic quarantine division:																					
San Francisco, Calif.					1										1				12		
Interstate and others.					3										3						
Trachoma.					1										5						
Rural sanitation.					2		1														
All others.					1																
Total.																					
Scientific research division:																					
Hygienic laboratory.					10		3									2					2
Leprosy investigation.					1		1								2	2					
Malaria.					2														2		1
Nutrition studies.					2											1					
Stream pollution.					1											7			5		2
Sewage disposal.					1											4					
Industrial hygiene and sanitation.					2			1							5	17			1		1
Child hygiene.					1										3	3			1		
Morbidity statistics.					1										3	3			1		
All others.					5			1							2	3			2		
Total.																					
Sanitary reports and statistics division.																				4,419	
Veneral diseases division.															46	10					1
Miscellaneous.																					
Total.	1	3	7	22	128	19	33	1	0	8	23	32	483	219	31	16	24	4,419			35

*Personnel of the Public Health Service, June 30, 1926—Continued*

296

PUBLIC HEALTH SERVICE

	General and technical												Totals			
	Col- labo- rating epi- demi- ologist	Ad- minis- trative assist- ant	Drug- gist	Nurse	Aide	Dieti- tian	Labo- rators in bac- teriol- ogy and roent- genol- ogy	Scien- tific hy- genic labo- ratory	Pilot	Ma- rine engi- neer	Clerk	All other em- ploy- ees	Medi- cal and scien- tific	Gen- eral and tech- nical	Sub	Grand total
<b>BUREAU</b>																
Surgeon General's office.....											3	2	1	5	6	
Chief clerk's office.....											31	22		53	53	
Divisions.....				2							121	5	11	128	138	
General inspection service.....											2		1	2	3	
Detailed to other offices.....											30	1	12	31	42	
Total.....													25	219		244
<b>FIELD</b>																
Coast Guard.....													22			2
General inspection service.....																
Perry Point, Md.....											4	9	1	13		14
Public-health districts.....		1									3		6	4		10
Waiting orders.....													18			18
Hospital division:																
Marine Hospital No. 1, Baltimore, Md.....		1		16	1	2	2				6	55	25	83	108	
Marine Hospital No. 2, Boston, Mass.....		1		12	1	1	2				4	57	18	78	96	
Marine Hospital No. 3, Buffalo, N. Y.....		1		10	1	1					4	19	18	36	54	
Marine Hospital No. 5, Chicago, Ill.....			1	16	2	2	2				7	53	24	83	107	
Marine Hospital No. 6, Cleveland, Ohio.....				11	1	1	1				6	27	14	47	61	
Marine Hospital No. 7, Detroit, Mich.....				10	2						5	31	16	48	64	
Marine Hospital No. 8, Evansville, Ind.....				5							2	15	7	22	29	
Marine Hospital No. 9, Fort Stanton, N. Mex.....		1	1	10	2	1	1				12	102	6	130	130	
Marine Hospital No. 10, Key West, Fla.....				4							1	11	4	16	20	
Marine Hospital No. 11, Louisville, Ky.....				5							4	19	15	28	43	
Marine Hospital No. 12, Memphis, Tenn.....				5			1				2	20	10	28	38	
Marine Hospital No. 13, Mobile, Ala.....				10	1		2				3	35	11	51	62	
Marine Hospital No. 14, New Orleans, La.....		1	1	34	3	3	3				15	103	35	163	198	
Marine Hospital No. 15, Pittsburgh, Pa.....		1	1	8	1		1				3	21	9	36	45	



Marine Hospital No. 16, Portland, Me.	1	6	1						1	18	14	27	41
Marine Hospital No. 17, Port Townsend, Wash.		11	1	1					2	30	5	45	50
Marine Hospital No. 18, St. Louis, Mo.		7			1				4	25	21	37	58
Marine Hospital No. 19, San Francisco, Calif.		2	33	4	1	2			7	99	24	148	172
Marine Hospital No. 20, Savannah, Ga.	1	1	12	1	1	1			5	31	14	52	66
Marine Hospital No. 21, Stapleton, N. Y.			30	3	3	2			12	126	21	176	197
Marine Hospital No. 22, Vineyard Haven, Mass.			2						1	7	3	10	13
Marine Hospital No. 43, Ellis Island, N. Y.	2	1	33	1	2	2			9	155	22	205	227
Marine Hospital No. 66, Carville, La.	2	1	1						5	256	9	265	274
Marine Hospital No. 70, Hudson St., N. Y.		1	5	4		2			11	40	35	63	98
Marine Hospital No. 82, Norfolk, Va.		1	22	2	2	2			8	80	21	117	138
Total hospitals											401	1,994	2,395
Relief stations:													
Second class	1		3	1		2			15	* 12	60	34	94
Third class									9		103	9	112
Miscellaneous											2		2
Total relief stations											165	43	208
Foreign quarantine division:													
Baltimore, Md.	1						1	2		17	2	21	23
Boston, Mass.			3				3	3		21	7	31	38
Ellis Island, N. Y. (immigration)									3	11	19	14	33
El Paso, Tex.									1	13	3	14	17
Galveston, Tex.							2	2	1	12	2	17	19
Fort Monroe, Va.							2	2	1	23	3	28	31
Laredo, Tex.										12	2	12	14
Marcus Hook, Pa.	1		2				2	2		12	3	19	22
New Orleans, La.							3	2	1	21	6	27	33
Rosebank, N. Y.			2				3	4	9	116	16	134	150
San Francisco, Calif. (immigration and quarantine)			1				4	2	3	45	6	55	61
San Juan, P. R.								1	2	23	3	26	29
Foreign ports									4	24	97	28	125
All others		1	3				14	18	11	171	89	218	307
Total											258	644	902
Domestic quarantine division:													
San Francisco, Calif.									3	23	1	23	24
Interstate and others										34	16	37	53
Trachoma			8						1	9	4	18	22
Rural sanitation			4						1	90	8	95	103
All others									3	13	1	16	17
Total											30	189	219

*Personnel of Public Health Service, June 30, 1926—Continued*

298

PUBLIC HEALTH SERVICE

	General and technical												Totals			
	Col- labo- rating epi- demi- ologist	Ad- minis- trative assist- ant	Drug- gist	Nurse	Aide	Dieti- tian	Labo- rators in bac- teriol- ogy and roent- genol- ogy	Scien- tific hy- genic labo- ratory	Pilot	Mar- ine engi- neer	Clerk	All other em- ploy- ees	Medi- cal and scien- tific	Gen- eral and tech- nical	Sub	Grand total
Scientific research division:																
Hygienic laboratory.....								29			10	58	17	97	114	
Leprosy investigation.....											1	4	4	5	9	
Malaria.....											1	11	7	12	19	
Nutrition studies.....											3	6	3	9	12	
Stream pollution.....											3	20	15	23	38	
Sewage disposal.....													4		4	
Industrial hygiene and sanitation.....					1											
Child hygiene.....					3	1					11	8	27	20	47	
Morbidity statistics.....					1						5	4	8	13	21	
All others.....											8	5	4	14	18	
											12	14	13	26	39	
Total.....													102	219		321
Sanitary reports and statistics division.....	23															
Venereal diseases division.....													4,419	23		4,442
Miscellaneous.....		1										9	56	9		65
											3		1	4		5
Total.....	23	17	12	351	34	21	28	29	34	38	459	2,315	5,504	3,361		8,865

## CHIEF CLERK'S OFFICE

### FORCE ON DUTY IN THE BUREAU

On June 30, 1926, there were 226 departmental employees on the rolls of the bureau, including 30 detailed for duty to the Bureau of Supply of the Treasury Department. This number represented a net decrease of 8 employees during the year, with a resulting net saving of \$14,060 in salary expenditures. The work of the bureau as a whole showed no decrease, and this saving in personnel was largely made possible by an increase in individual efficiency and improvements in methods of work. The average salary on June 30, 1926, was \$1,679, as compared with \$1,702 at the beginning of the fiscal year.

### PRINTING AND BINDING

The total expenditure for printing and binding for the Public Health Service was \$81,133.56. Of this amount, \$67,983.18 was expended for the printing of publications, \$9,846.86 for blank forms and records, and \$3,303.52 for binding books for library and reference use, both in Washington and at field stations. The number of copies of publications printed was 1,126,299 and of blank forms 6,655,802.

### PUBLIC HEALTH SERVICE LIBRARY

During the fiscal year 1926 the bureau library received accessions of 291 bound volumes and 300 pamphlets, making a net total on hand at the end of the year of 11,339 volumes and approximately 5,350 pamphlets. The library received regularly 160 medical and scientific journals, of which only 34 were paid subscriptions. These were circulated to the respective divisions and used in the library for reference purposes. Approximately 125 monthly and weekly bulletins from State, city, and foreign health departments were also received.

The library force, while small, did a considerable amount of research and reference work for the scientific officers and employees of the service, and also in order to furnish information in response to inquiries. In the work of the library extensive use is made of the facilities of other libraries in the city.

### IMPROVEMENTS AND ECONOMIES

Expenditures for supplies and services for the bureau were reduced from \$13,179.89 in 1925 to \$10,489.02 in 1926. The work of consolidating the files of all bureau divisions into a central unit

progressed materially, and a considerable quantity of old archives and records were examined and arranged in accordance with modern filing methods.

Punctuality in reporting for duty continued to improve, the cases of tardiness being 1.7 per annum per employee, as compared with 2.3 in the previous year. The average sick leave for the year was 8.7 days per employee.

#### BUILDINGS AND OFFICE QUARTERS

The bureau now occupies space in the Butler Building and Buildings C and F, the latter two being temporary structures. The service also operates the Hygienic Laboratory, a plant of considerable extent, comprising 4 permanent buildings on a site of approximately 5 acres at Twenty-fifth and E Streets NW. It would be greatly in the interest of efficiency and economy if a suitable modern building for the accommodation of all the bureau activities could be provided immediately adjacent to the present Hygienic Laboratory.



## NURSING, DIETETIC, AND RECONSTRUCTION SECTION

During the past fiscal year the work of the nursing service has gone forward as usual with 356 nurses, 21 dietitians, and 40 aides on duty, of whom the great majority of nurses, 325, and all dietitians and aides are appointed to the hospital division. In the child hygiene section there are 3 nurses; industrial hygiene section, 2 nurses; trachoma work, 8 nurses; and rural sanitation, 5 nurses. In foreign quarantine there are assigned 2 nurses at Hoffmans Island, 2 at Gallops Island, 1 at Angel Island, and 1 for part time at New Orleans quarantine.

Out of the 356 nurses 170 have left the service, but have all been replaced. This constitutes almost 50 per cent of the total number employed; of these 170, 1 died, 31 married, and 25 were released as not qualified for the service, a total of 57, leaving 113. Of this number 10 resigned to go with other Government services, 10 to accept better positions, and 14 on account of illness in family, leaving 79 who resigned, giving no adequate reason for this action.

Of these conditions there may be cited as causes of dissatisfaction:

1. *Quarters.*—Quarters for nurses in the Public Health Service stations, while much improved, are still below the average found in other Government services and in civilian institutions. This is believed to be the most serious handicap to the nursing service.

2. *Lack of promotion in pay for length of service.*—This is a much discussed topic, and even a small increase in salary for each three-year period of service would go far toward increasing the stability of the service.

While the turnover is larger than in other Government services, it is in some degree offset by the fact that there is a list of nurses awaiting appointments in the service and about one-third of those who resign request reinstatement. During the year 247 inquiries and requests for applications were received; of these 76 applications were completed and sent to the Civil Service Commission and 12 were rejected.

There were certified to the Public Health Service by the Civil Service Commission 276 names. There were 74 selected on papers forwarded by the Public Health Service to the Civil Service Commission, and 29 directly from civil-service certificates. The total of those appointed who failed to report was 34. From these figures it will be seen that the greater number of nurses appointed to the service were recruited by the Public Health Service.

New appointments for the year were 114, reinstatements 41, and 3 additional nurses were appointed due to the increase in the number of patients. There were 30 promotions. Travel orders were written

for 236 nurses during the year, of whom 112 were furnished with transportation, 49 were appointed without expense, and 75 paid their own transportation; therefore, more than 50 per cent of those appointed traveled at no expense to the Government. All nurses who desire reinstatement are required to defray their own transportation expenses.

Legislation similar to that by which the Army and Navy Corps are established becomes increasingly urgent. The passage of the retirement bill for the Army and Navy nurses is an added reason. The professional qualifications for appointment in all these services are the same, and the pay, privileges, etc., should be the same as well. The quality of work performed by nurses in the Public Health Service is as good as is found in any hospitals, Government or civilian, throughout the country, and it would be of material advantage to the bureau if this nursing service were placed on a definite legislative basis and if better quarters could be furnished.

During the year the superintendent of nurses has inspected the nursing dietetic, and physiotherapy work in stations at Stapleton, Ellis Island, Hudson Street, Baltimore, Norfolk, San Francisco, Port Townsend, Chicago, St. Louis, Rolla, and Memphis. The service in these stations is excellent. In many of the stations the work is handicapped by defects in construction, lack of adequate space, need for repairs, etc., but in spite of these handicaps the service rendered the patients from all departments compares favorably with similar service in other Government or civilian institutions.

There are 21 dietitians on duty in the service, and of these, 10 resigned during the past year.

Of 33 aids, 7 resigned, 2 were discontinued as not meeting requirements, and 2 were discontinued on reduction of personnel; not as large a proportion as in the nursing and dietetic services, but too large for the stability which is desired.

The superintendent of nurses has attended a number of nursing conferences as usual. She has served as secretary of the nurses' advisory council of the Veterans' Bureau, of which two meetings were held, and she was reelected chairman of the section on Government nursing services of the American Nurses' Association. Various papers have been prepared for publication or for special meetings.

The classes in public-health nursing in cooperation with the Instructive Visiting Nurse Association have been continued. Three classes have received a course of 16 lectures each by officers of the Public Health Service.

An exhibit for the nursing service in conjunction with the regular service exhibit has been prepared for the Sesquicentennial Exposition at Philadelphia.

The supervision of the emergency rest room has been, as usual, under the care of the nursing section. Follow-up of absentees without home visits has been carried on and monthly reports of illnesses made to the industrial hygiene section. One thousand four hundred visits to the emergency room C building have been made, an average of four and one-half visits a day during 305 working days. Of this number, 193 were employees from other Government bureaus in C and F buildings, or cases brought in from the street, which included slight injuries, accident, or illness, leaving 1,207 members of the Public Health Service who were cared for in the rest room.

## RECOMMENDATIONS

### SCIENTIFIC RESEARCH

The continuation of scientific research into the causes and prevention of human disease appears to be amply justified by the advances recorded for the year of this report. Quite aside from these accomplishments, it is of value to the public to maintain an establishment where reliable and unprejudiced information concerning health matters can be secured. The continuation of this research work on an at least undiminished scale is heartily recommended.

### NATIONAL QUARANTINE SERVICE

New quarantine stations are needed at New Orleans, La., Sabine, Tex., and San Pedro, Calif.

In view of the changed conditions and the rapid growth of shipping at New Orleans, it is necessary for efficiency of service and economy of administration that the quarantine station be removed from its present location, 90 miles down the river, to a suitable site near the city. Neither Sabine nor San Pedro has any facilities whatever for the housing of persons detained because of quarantinable disease or of the personnel and paraphernalia necessary for the conduct of quarantine activities. The business of these ports, already large, is rapidly increasing, and it is imperative that adequate facilities be provided.

### MAINTENANCE OF MARINE HOSPITALS

In my last two annual reports mention was made of the necessity for sufficient appropriations properly to fulfill the Government's obligations to its beneficiaries. It was necessary, because of insufficient funds, to reduce the average per diem cost of hospital care to a point incompatible with satisfactory treatment. The care of sick and injured persons in any hospital is subject to a certain amount of public scrutiny. If the standards furnished fall below the conventional, public criticism follows. An increase in the appropriations is necessary.

New construction to replace obsolete and dilapidated buildings, to increase ward capacity, and provide housing facilities for personnel are needed, particularly at the marine hospitals in New Orleans, San Francisco, Baltimore, Buffalo, Mobile, Key West, Fort Stanton, New Mexico, and Portland, Me. Marine hospitals are also needed at Seattle and Galveston.

## PERSONNEL

Attention is again invited to the fact that higher standards of medical education with consequent increased cost and the greater rewards to be found in private practice are causing increased difficulty in securing and retaining the type of physician and other scientific personnel essential to the varied and difficult duties incumbent upon the Public Health Service. In addition to this need for medical officers attention is again invited to the desirability of suitable legislation for the commissioning of sanitary engineers, dental and other scientific personnel having special responsibilities and subject to change of station.

The need for additional commissioned officers in the regular commissioned corps of the service has been emphasized in former annual reports. Because of the extension to European ports of the medical examination of intending immigrants, this need has been more acutely felt during the past year than ever before. Efficient handling of the work abroad demands officers experienced in immigration work and methods in this country. It also requires training in the methods of examination, particularly in respect to mental examinations. Moreover, the training of officers to replace those who have completed a tour of three years' duty abroad is essential. The diverse duties of the service afford younger officers entering the service experience which will fit them to take their turn on foreign details. At the same time the number of medical officers employed under specific appointment can be reduced and the mobility and effectiveness of the corps increased for emergencies such as epidemics and special investigations of public-health matters. It is earnestly recommended, therefore, that authority be given to materially increase the number of commissioned officers. It is also recommended that the appropriations be so increased as to adequately recompense for professional services and thereby insure their worth.

Attention has been repeatedly directed, both by congressional committees and others, to the number of public health activities now scattered throughout Government organizations whose major purpose is not public health. Pending perhaps more radical changes by the Congress, it is believed that much good might be accomplished by suitable legislation providing for the detail of personnel of the Public Health Service to such departments, bureaus, or independent establishments to perform public health functions either by direction of the President or by request of the head of such departments to the Surgeon General.

H. S. CUMMING,  
*Surgeon General.*

To the honorable A. W. MELLON,  
*Secretary of the Treasury.*



# APPENDIX

## FINANCIAL STATEMENT

The following is a statement of expenditures from appropriations for the Public Health Service for the fiscal year 1926:

Appropriation	Appropriated	Obligations			Unobligated balance
		Incurred	Liquidated	Outstanding	
Public Health Service proper:					
Salaries, office of Surgeon General, Public Health Service	\$101,560.00	\$100,928.35	\$100,928.35		\$631.65
Books, Public Health Service	500.00	493.66	442.84	\$50.82	6.34
Freight, transportation, etc., Public Health Service	25,000.00	24,584.01	20,546.61	4,037.40	415.99
Maintenance, Hygienic Laboratory, Public Health Service	43,400.00	43,055.59	38,449.01	4,606.58	344.41
Pay, etc., commissioned officers and pharmacists, Public Health Service	1,125,000.00	1,124,143.20	1,103,843.01	20,300.19	856.80
Pay of acting assistant surgeons, Public Health Service	315,000.00	305,154.78	303,976.85	1,177.93	9,845.22
Pay of other employees, Public Health Service	1,020,000.00	1,007,719.97	1,007,532.96	187.01	12,280.03
Preparation and transportation of remains of officers, Public Health Service	3,000.00	479.57	479.57		2,520.43
Pay of personnel and maintenance of hospitals, Public Health Service	<sup>1</sup> 5,550,037.72	5,529,213.12	5,441,154.93	88,058.19	20,824.60
Quarantine Service	470,000.00	461,972.49	395,771.47	66,201.02	8,027.51
Preventing the spread of epidemic diseases	366,299.30	350,399.03	335,758.69	14,640.34	15,900.27
Preventing the spread of epidemic diseases, 1925 and 1926	<sup>2</sup> 102,874.29	99,225.67	92,773.87	6,451.80	3,648.62
Field investigations of public health	282,054.00	277,663.66	268,165.67	9,497.99	4,390.34
Interstate quarantine service, 1925 and 1926	22,530.00	21,101.78	18,176.79	2,924.99	1,428.22
Studies of rural sanitation, Public Health Service	<sup>2</sup> 49,601.22	48,697.20	44,878.92	3,818.28	904.02
Control of biologic products, Public Health Service	75,000.00	73,000.00	71,836.58	1,163.42	2,000.00
Expenses, Division of Venereal Diseases, Public Health Service	45,000.00	44,960.17	40,826.67	4,133.50	39.83
Marine hospitals—	75,000.00	65,280.86	63,049.58	2,231.28	9,719.14
Baltimore, Md.	<sup>2</sup> 387.12				387.12
Savannah, Ga.	<sup>2</sup> 2,392.13	2,014.99	2,014.99		377.14
Boston, Mass.	<sup>2</sup> 15,208.26				<sup>3</sup> 15,208.26
New Orleans, La.	<sup>2</sup> 887.67	884.50	362.07	522.43	3.17
Quarantine station, Boston, Mass.	<sup>2</sup> 3,835.72				3,835.72
Total, Public Health Service proper	9,694,567.43	9,580,972.60	9,350,969.43	230,003.17	113,594.83
Allotments from United States Veterans' Bureau:					
Medical and hospital services, Veterans' Bureau	357,175.00	355,562.00	354,148.40	1,413.60	1,613.00
Salaries and expenses, Veterans' Bureau	6,047.67	6,047.67	6,047.67		
Total, Veterans' Bureau funds	363,222.67	361,609.67	360,196.07	1,413.60	1,613.00
Grand total	10,057,790.10	9,942,582.27	9,711,165.50	231,416.77	115,207.83

<sup>1</sup> Includes \$302,554.72 reimbursement for care and treatment of Veterans' Bureau patients and miscellaneous items.

<sup>2</sup> Balance available July 1, 1925.

<sup>3</sup> Carried to the surplus fund of the Treasury.

Statement showing detailed expenditures, as required by act approved March 6, 1920:

*Preventing the spread of epidemic diseases*

Purpose	Allotted	Obligations			Unobligated balance
		Incurred	Liquidated	Out-standing	
REGULAR 1926 APPROPRIATION					
Trachoma prevention .....	\$28,793.10	\$28,307.06	\$28,307.06	-----	\$486.04
Payment of personnel and other expenses in connection with plague and yellow-fever prevention.....	187,028.87	176,438.79	170,592.82	\$5,845.97	10,590.08
Expenses at foreign quarantine stations and certain ones in the United States engaged in epidemic work.....	127,075.00	124,780.41	116,703.72	8,076.69	2,294.59
Rocky Mountain spotted-fever control, including maintenance of laboratory at Hamilton, Mont.....	19,602.00	18,922.78	18,554.93	367.85	679.22
Postage for mailing epidemic reports to foreign countries.....	1,018.71	862.15	862.15	-----	156.56
Vaccine and vaccine points at United States marine hospitals and relief stations.....	1,087.84	1,087.84	738.01	349.83	-----
Unallotted balance.....	1,693.78	-----	-----	-----	1,693.78
Total regular 1926 appropriation.....	366,299.30	350,399.03	335,758.69	14,640.34	15,900.27
DEFICIENCY APPROPRIATION, 1925 AND 1926					
Trachoma prevention .....	29,100.00	28,457.12	24,668.29	3,788.83	642.88
Payment of personnel and other expenses in connection with plague and yellow-fever prevention.....	72,200.46	70,768.55	68,105.58	2,662.97	1,431.91
Unallotted balance.....	1,573.83	-----	-----	-----	1,573.83
Total deficiency appropriation, 1925 and 1926.....	102,874.29	99,225.67	92,773.87	6,451.80	3,648.62
Grand total.....	469,173.59	449,624.70	428,532.56	21,092.14	19,548.89

<sup>1</sup> Balance available July 1, 1925.

Analysis of expenditures in accordance with General Accounting Office Bulletin No. 1, of May 11, 1922:

*Preventing the spread of epidemic diseases*

[Actual payments]

Classification		1926 appropriation	1925 and 1926 appropriation	Total
01	Personal services.....	\$290,630.50	\$73,655.79	\$364,286.29
	SUPPLIES AND MATERIALS			
0200	Stationery and office supplies.....	1,407.66	2,094.46	3,502.12
0210	Medical and hospital supplies.....	4,684.04	3,800.63	8,484.67
0220	Scientific and educational supplies.....	3,046.99	209.11	3,256.10
0230	Fuel.....	1,424.55	617.91	2,042.46
0240	Wearing apparel, etc.....	82.36	191.30	273.66
0250	Forage and supplies for animals.....	1,241.39	183.70	1,425.09
0260	Provisions.....	5,873.05	3,487.91	9,360.96
0280	Sundry supplies.....	712.67	359.91	1,072.58
0290	Materials.....	450.97	141.30	592.27
02	Total supplies and materials.....	18,923.68	11,086.23	30,009.91
03	Subsistence and support of persons.....	120.00	30.00	150.00
04	Storage and care of vehicles.....		4.00	4.00
05	Communication service.....	774.09	188.75	962.84
06	Travel expenses.....	9,954.00	4,186.67	14,140.67
07	Transportation of things.....	1,592.78	489.43	2,082.21
10	Heat, light, power, and water.....	624.43	290.00	914.43
11	Rents.....	8,601.07	901.48	9,502.55
12	Repairs and alterations.....	35.01	21.50	56.51
13	Miscellaneous current expenses.....	1,663.78	641.25	2,305.03
	EQUIPMENT			
3000	Automotive equipment.....	1,176.44		1,176.44
3010	Furniture and fixtures.....	609.91	584.49	1,194.40
3020	Educational, scientific, and recreational equipment.....	71.05	13.76	84.81
3050	Other equipment.....	981.95	680.52	1,662.47
30	Total equipment.....	2,839.35	1,278.77	4,118.12
	Total.....	335,758.69	92,773.87	428,532.56

*Quarantine service—Expenditures by stations*

[Exclusive of expenditures from the appropriation "Preventing the spread of epidemic diseases"]

Name of station	Pay of officers and employees	Maintenance	Total
CONTINENTAL QUARANTINE STATIONS			
Baltimore, Md.	\$30,369.46	\$29,840.57	\$60,210.03
Beaufort, S. C.	975.00	208.75	1,183.75
Biscayne Bay (Miami), Fla.	1,437.50	100.80	1,538.30
Boca Grande, Fla.	2,378.50	1,171.29	3,549.79
Boston, Mass.	45,902.04	34,538.62	80,440.66
Brownsville, Tex.	7,407.00	705.76	8,112.76
Brunswick, Ga.	4,805.76	2,371.61	7,177.37
Cape Fear (Southport), N. C.	9,667.00	4,241.74	13,908.74
Cedar Keys (Bronson), Fla.	280.00	—	280.00
Charleston, S. C.	9,908.14	2,784.59	12,692.73
Columbia River (Astoria), Oreg.	18,596.33	3,642.38	22,238.71
Coos Bay (North Bend), Oreg.	290.00	—	290.00
Cumberland Sound (Fernandina), Fla.	3,540.00	77.04	3,617.04
Delaware Bay and River (Philadelphia), Pa.	5,951.33	18,577.81	24,529.14
Delaware Breakwater (Lewes), Del.	2,302.60	589.55	2,892.05
Del Rio, Tex.	3,159.50	2,097.41	5,256.91
Eagle Pass, Tex.	15,464.19	2,645.20	18,109.39
Eastport, Me.	840.00	—	840.00
El Paso, Tex.	27,638.83	3,994.14	31,632.97
Eureka, Calif.	—	125.50	125.50
Fall River, Mass.	600.00	—	600.00
Fort Monroe (Norfolk), Va.	41,624.54	24,247.93	65,872.47
Freeport, Tex.	1,720.00	477.00	2,197.00
Galveston, Tex.	30,081.62	15,639.07	45,720.69
Georgetown, S. C.	60.00	—	60.00
Gulfport, Miss.	4,855.00	1,110.78	5,965.78
Hidalgo, Tex.	2,479.00	1,572.00	4,051.00
Ketchikan, Alaska.	225.00	—	225.00
Key West, Fla.	7,603.28	815.84	8,419.12
Lake Sabine district, Tex.	24,218.00	4,758.35	28,976.35
Laredo, Tex.	20,826.79	2,446.35	23,273.14
Marcus Hook, Pa.	32,000.16	40,863.50	72,863.66
Mobile, Ala.	19,607.59	8,829.36	28,436.95
New Orleans, La.	49,235.99	10,374.35	59,610.34
Newport, R. I.	—	5.00	5.00
New York, N. Y.	213,438.47	107,195.46	320,633.93
Ogdensburg, N. Y.	100.00	—	100.00
Pascagoula, Miss.	537.50	—	537.50
Pensacola, Fla.	12,435.00	3,750.69	16,194.69
Perth Amboy, N. J.	875.00	1,287.20	2,162.20
Port Angeles, Wash.	—	39.00	39.00
Portland, Me.	13,165.00	3,172.11	16,337.11
Port San Luis, Calif.	300.00	—	300.00
Port Townsend, Wash.	24,139.41	4,054.28	28,193.69
Presidio, Tex.	3,570.00	796.15	4,366.15
Providence, R. I.	7,038.33	1,918.34	8,956.67
Reedy Island, Del.	5,968.33	1,330.80	7,299.13
Rio Grande, Tex.	7,009.00	95.88	7,104.88
Roma, Tex.	—	828.25	828.25
St. Andrew (Panama City), Fla.	840.00	90.00	930.00
St. Georges Sound (Carabelle), Fla.	300.00	45.00	345.00
St. Johns River (Mayport), Fla.	4,528.66	1,180.95	5,709.61
St. Joseph, Fla.	210.00	230.00	440.00
San Diego, Calif.	13,565.17	4,416.82	17,981.99
San Francisco, Calif.	72,782.11	41,204.66	113,986.77
San Pedro, Calif.	5,808.00	10,368.71	16,176.71
Savannah, Ga.	14,976.18	5,243.55	20,219.73
Seattle, Wash.	8,730.00	6,956.34	15,686.34
Tampa Bay, Fla.	11,971.97	7,050.09	19,022.06
Terlingua, Tex.	110.00	—	110.00
Texas City, Tex.	1,080.00	—	1,080.00
Vineyard Haven, Mass.	—	10.00	10.00
Freight and miscellaneous expenses.	—	20,000.00	20,000.00
Total continental quarantine stations.	849,528.18	440,125.57	1,289,653.75
INSULAR QUARANTINE STATIONS			
Territory of Hawaii.	20,633.82	10,438.05	31,071.87
Porto Rico.	39,594.04	10,137.23	49,731.27
Virgin Islands.	16,780.33	1,271.04	18,051.97
Total insular quarantine stations.	77,008.19	21,846.92	98,855.11
Total continental and insular quarantine stations.	926,536.37	461,972.49	1,388,508.86



# INDEX

## A

	Page
Absenteeism, school, with relation to endemic goiter.....	18
Abstracts of field reports.....	225
Accounts section.....	292
Acting assistant surgeons, number on duty.....	290
Activities recommended by the advisory committee on the education of sanitarians and the future of public health in the United States.....	131
Administrative assistants, and pharmacists, number on duty.....	291
Administrative headquarters, contract physicians, table showing.....	219
Administrative health practice.....	36
Agriculture, Department of, cooperation with.....	9
Aircraft traffic.....	162
Alastrim, prevalence of.....	157
Alien seamen inspected and certified at all ports in the United States and Canada, table showing.....	176
Alien passengers inspected and certified at all ports in the United States and its dependencies, and in Canada, table showing.....	172
Aliens ( <i>see also</i> Immigrants).....	169-171
American College of Surgeons.....	216
American Public Health Association, cooperation with.....	12
American Social Hygiene Association.....	263
Amoy, China, quarantine transactions at.....	159, 166
Analysis, lead.....	68
Analysis of arsenicals.....	68
Anthrax, prevalence of.....	111, 203
Appendix (financial statement).....	305-308
Arsenicals, analysis of.....	68
Attending specialists.....	216
Number on duty.....	290
Automobile accidents, death rates.....	8
Average per diem cost of in-patient relief, United States marine hospitals, 1926, chart showing.....	212

## B

Baltimore, Md., United States marine hospital.....	225
Bills rendered for quarantine services at maritime stations during the fiscal year, 1926, table showing.....	162, 163
Biologic products:	
Control of.....	63
Regulation of interstate traffic in.....	3
Biological significance of glutathione and cystine.....	66
Black tongue, studies of.....	32
Boards convened.....	291
Boca Grande, Fla., report of quarantine station.....	138
Boston, Mass.:	
Immigration station.....	179
Quarantine station.....	138
Boston (Chelsea), Mass., United States marine hospital.....	226
Buffalo, N. Y., United States marine hospital.....	226
Buildings and office quarters.....	300
Bulletins:	
Hygienic Laboratory.....	208
Public health.....	207
Bureau of Mines, cooperation with.....	48
Bureau of Standards, cooperation with.....	48
Bureaus of the Treasury Department, cooperation with.....	9

## C

	Page
Cairo, Ill., Relief Station No. 220.....	239
California, cooperation with State and local health authorities.....	288
Cancer:	
Death rates.....	8
Investigation of.....	14, 15
Study of.....	66
Carlsbad Cave National Monument.....	126
Carville, La., United States marine hospital ( <i>see</i> Public Health Reports, vol. 41, No. 46, November 12, 1926).....	238
Cases of syphilis and gonorrhea reported to State boards of health, by months, chart showing.....	265
Cases of venereal diseases reported to State boards of health, chart showing.....	264
Cases of venereal disease reported to State boards of health, table showing.....	271
Catalogue, index, medical and veterinary zoology.....	65
Causes of admission for discharged patients and conditions on discharge, United States marine hospitals and other relief stations, fiscal year 1926, table showing.....	249, 250
Causes of death in United States marine hospitals and other relief stations during fiscal year 1926, table showing.....	251, 252
Causes of industrial absenteeism, studies of.....	46
Charts:	
Average per diem cost of in-patient relief, United States marine hospitals, 1926.....	212
Cases of syphilis and gonorrhea reported to State boards of health, by months.....	265
Cases of venereal diseases reported to State boards of health.....	264
Classes of beneficiaries treated, fiscal year 1926, at Marine Hospital No. 43.....	237
Classes of beneficiaries treated, Marine Hospital No. 43, fiscal year 1925.....	236
Patients admitted to clinics.....	267
Patients discharged as noninfectious.....	267
Patients of United States Public Health Service in marine hospitals and relief stations.....	221
Syphilis and gonorrhea, total cases reported to State boards of health by months and years.....	266
Total relief and physical examinations furnished from 1915 to 1926 to "old line" Public Health Service beneficiaries.....	211
Variations according to age of respiratory diseases in families of medical officers of Army, Navy, and Public Health Service, 1924.....	21
Chemistry, division of.....	67, 68
Chicago, Ill., United States marine hospital.....	226
Chicken pox, prevalence of.....	139, 147
Chief clerk's office, report of.....	299
Buildings and quarters.....	300
Force on duty in the bureau.....	299
Improvements and economies.....	299
Printing and binding.....	299
Public Health Service Library.....	299
Child health, studies of.....	2
Child hygiene:	
Dental hygiene in school children.....	41
Girl Scout organization, cooperation with.....	37
Growth and development of school children.....	38
Mental and physical status of negro children.....	37
Natural illumination of classrooms, studies.....	39
Physical development.....	38
Vision of school children.....	40
Cholera:	
Infection from shellfishing grounds.....	169
Prevalence of.....	133, 156, 159, 161, 168, 169, 201
Civil Service Commission, cooperation with.....	10
Classes of beneficiaries treated, fiscal year 1925, at Marine Hospital No. 43, chart.....	236

	Page
Classes of beneficiaries treated, fiscal year 1926, at Marine Hospital No. 43, chart.....	237
Classification of out-patient treatments furnished at United States marine hospitals and other relief stations, fiscal year 1926, table showing.....	257
Cleveland, Ohio, United States marine hospital.....	227
Clinic, Hot Springs.....	260
Clinical information.....	222
Clinical studies and investigations.....	260
Clinical work.....	215
Clinics, venereal disease.....	265
Clonorchiasis, studies of.....	16
Coast Guard, United States.....	210
Colored population, work with.....	263
Commerce, Department of, cooperation with.....	10
Commissioned medical officers, number on duty.....	289
Commissioned officers in European ports.....	282
Comparative results of medical examinations of applicants for visas for different geographic areas, table showing.....	191
Comparison of cases of principal communicable diseases and deaths, 1925, table showing.....	199
Conference of the Surgeon General with State and Territorial health officers.....	132
Conference, international, on the health of merchant seamen.....	215
Congress of the Royal Institute of Public Health.....	194
Consolidated annual X-ray report, marine hospitals and second-class relief stations, table.....	218
Consolidated clinical laboratory report, marine hospitals and second-class stations, table.....	216, 217, 218
Construction and repair.....	224
Continental quarantine stations, table showing transactions at.....	137
Contract dental surgeons, number on duty.....	291
Contract physicians.....	218
Control of venereal disease.....	8
Cooperation of Public Health Service with—	
American Public Health Association.....	12
Bureau of Mines.....	48
Bureau of Standards.....	48
Bureaus of the Treasury Department.....	9
Civil Service Commission.....	10
Department of Agriculture.....	9
Department of Commerce.....	10
Department of Justice.....	9
Department of Labor.....	10
Department of State.....	9
Health section of the League of Nations.....	9
Interior Department.....	9
International Commission on Zoological Nomenclature.....	65
International Institute of Statistics.....	12
International Sanitary Office.....	9
Millbank Memorial Fund.....	12
Other Government departments.....	9, 48
Post Office Department.....	9, 48
State and local health and other agencies.....	10
State boards of health.....	69
State health departments and railroad water-supply supervision.....	116, 120, 122
United States Employees' Compensation Commission.....	10
United States Shipping Board.....	10
United States Veterans' Bureau.....	10
War and Navy Departments.....	9
Cooperative rural health work.....	4
Cooperative work with State health departments.....	258
Cornell University, laboratory facilities furnished by.....	12
Correctional and penal institutions.....	267

Costs:	Page
In-patient relief, United States marine hospitals, chart showing average per diem.....	212
Per diem cost of operations in marine hospital, average.....	209
Crater Lake National Park.....	125
Cumberland Sound, Fla., report from continental quarantine station....	139

## D

Death rates:	
Automobile accidents.....	8
Cancer.....	8
Diabetes.....	8
Typhoid fever.....	8
Decisions of the Comptroller General.....	283, 284
Dengue fever, prevalence of.....	130
Dental unit.....	218
Detroit, Mich., United States marine hospital.....	227
Diabetes, death rates.....	8
Diphtheria, prevalence of.....	2, 6, 183, 200
Diseases affecting the Philippine Islands.....	158, 159
Diseases:	
Investigation of ( <i>see also</i> Investigations and studies).....	2
Prevalence of.....	199
Alastrim.....	157
Anthrax.....	111, 203
Chicken pox.....	139, 147
Cholera.....	133, 156, 159, 161, 168, 169, 201
Dengue fever.....	130
Diphtheria.....	2, 6, 183, 200
Influenza.....	19, 148, 200, 203
Leprosy.....	150, 154, 160
Malaria.....	27, 200, 202
Measles.....	147, 183, 199, 200
Ohara's (tularemia).....	169
Pellagra.....	3, 200
Plague.....	133, 158, 159, 160, 165, 167, 202
Pneumonia.....	200
Poliomyelitis.....	200
Quarantinable.....	5
Relapsing fever.....	202
Scabies.....	183
Scarlet fever.....	3, 183, 200
Smallpox.....	2, 5, 6, 7, 84, 133, 139, 141, 148, 149, 150, 152, 153, 154, 155, 157, 159, 160, 165, 167, 168, 169, 201, 202, 287, 288
Trachoma.....	63, 101-103, 202
Tuberculosis.....	201
Tularemia.....	76
Typhoid fever.....	2, 107, 109, 113, 115, 118, 128, 201
Typhus fever.....	5, 134, 153, 154, 160, 165, 202
Yellow fever.....	129, 130, 134, 154, 160, 202
Whooping cough.....	183, 201
Studies of. ( <i>See</i> Investigations.)	
Disinfection. ( <i>See</i> Fumigation.)	
Distribution according to class of applicants for immigration visas who were medically examined at each station August 1, 1925, to June 30, 1926, table showing.....	187
Distribution of mixed ethyl esters of chaulmoogra oil, table showing.....	25
District of Columbia Girl Scout organization.....	37
Districts, public health.....	285
Domestic quarantine ( <i>see</i> Interstate quarantine).....	70
Drainage studies.....	31
Drug addiction, study of.....	63, 66
Drugs for treatment of syphilis, study of.....	66



## E

Economies:	Page
Chief clerk's office.....	299
Hospital division.....	209
Educational pamphlets and placards purchased and reprinted by State boards of health, table showing summary of.....	268, 269
Educational work with newspapers and journals.....	262
Ellis Island, N. Y., United States marine hospital.....	235
El Paso, Tex.:	
Report from quarantine station.....	153
Report from immigration station.....	179
Employees' Compensation Commission, United States.....	213
Cooperation with.....	10
Encephalitis, epidemic, study of.....	62
Endemic goiter and intelligence.....	17
Epidemiologists:	
Collaborating and assistant collaborating.....	195
Collaborating and assistant collaborating, table showing.....	196
Number on duty.....	291
European ports, medical examinations in.....	6, 186
Evansville, Ind., United States marine hospital.....	227
Examinations:	
Intestinal parasites for diagnosis.....	65
Prospective immigrants abroad.....	170
Physical.....	219
Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health, table showing.....	269
Exhibits, Public Health Service at Sesquicentennial Exposition, Philadelphia.....	287
Expenditures ( <i>see also</i> Financial statement):	
Improvements and economies.....	299
Printing and binding.....	299

## F

Field reports, abstracts of.....	225
Financial statement.....	305-308
Fish control of mosquito production.....	28
Fleas, survey of.....	145-146
Force on duty in the bureau.....	299
Foreign and insular quarantine and immigration, report of division of.....	133
Acquisition of the Texas quarantine system.....	135
Alien passengers inspected and certified at all ports in the United States and its dependencies, and in Canada, table showing.....	176
Alien seamen inspected and certified at all ports in the United States and Canada, table showing.....	176
Bills rendered for quarantine service at maritime stations during the fiscal year, 1926, table showing.....	162, 163
Changes in quarantine procedure.....	134
Comparative results of medical examinations of applicants for visas for different geographic areas, table showing.....	191
Distribution according to class of applicants for immigration visas who were medically examined at each station, August 1, 1925, to June 30, 1926, table showing.....	187
European ports.....	186
Examination of prospective immigrants abroad.....	170
General prevalence of quarantinable diseases.....	133
Hoffman Island transactions, table showing.....	148
International relations.....	136
Laboratory division transactions, table showing.....	147
Laboratory examinations, table showing.....	184
Medical inspection of aliens.....	169
Nationalities represented by aliens, table showing.....	182
New quarantine station at Mobile, Ala.....	134
Number and percentage of applicants for immigration visas who were certified for different classes of disabilities, table showing.....	188

	Page
Foreign and insular quarantine and immigration—Continued.	
Number and percentage of immigration cases pending at the close of the fiscal year, table showing	190
Number and percentage of the total persons certified for each class of disability who were refused visas on medical grounds, table showing	189
Number and percentage of the total persons examined who were refused visas on medical certification for different classes of conditions, table showing	189
Number of aliens inspected and certified, table showing	181
Percentage distribution of persons certified for disabilities according to class of condition, table showing	188
Philippine Islands, operations of the service in	158
Porto Rico, operations of the service in	157
Quarantine transactions	133
Quarantine transactions on the Texas-Mexican border for the fiscal year 1926, table showing	153
Quarantine transactions, table showing summary of	169
Report of service operations in Europe, table showing	166
Reports from continental quarantine stations	138
Reports from foreign ports	164
Reports from immigration stations	179
Reports from insular quarantine stations	154
Results of medical examinations of applicants for immigration visas for two periods and for the whole 11 months, table showing	191
Summary of quarantine transactions	169
Summary of transactions at national (continental and insular) quarantine stations for the fiscal year 1926	137
Summary of transactions at national (continental and insular) quarantine stations, 1926, table showing	137, 138
Transactions at continental quarantine stations, table showing	137
Transactions at foreign ports	163
Transactions at foreign ports, table showing summary of	163
Transactions at Habana, Cuba, table showing	167
Transactions at insular quarantine stations, table showing	154
Vaccination history and the occurrence of vermin infestation of applicants for immigration visas, table showing	193
Violation of quarantine laws	136
Virgin Islands, operations of the service in	157
Foreign quarantine and immigration	5
Foreign seamen	215
Fort Stanton, N. Mex., United States marine hospital	227
Fumigation of rags	134
Fumigation of vessels	93-94, 133-134, 138-141, 143-144, 148-151, 157, 161
Functions of the Public Health Service	1
<b>G</b>	
Galveston, Tex., Relief Station No. 245	240
Girl Scout organization, cooperation with	37
Glacier National Park	125
Goiter:	
Endemic, and intelligence	17
Endemic, and physical development	18
Endemic, and school absenteeism	18
Endemic, in Connecticut	17
Endemic, in Massachusetts	17
Field studies	4
Incidence in the United States	19
Iodine determinations	19
Potential foci of infection	18
References	19
Studies	4, 17
Government departments, cooperation with	48
Grand Canyon National Park	124
Ground squirrels, eradivative measures	87-88

Growth and development of school children:	Page
Oral hygiene.....	38
Physical development.....	38
Physical examinations.....	38
Guayaquil, Ecuador, quarantine transactions at.....	167

H

Habana, Cuba, quarantine transactions at.....	167
Harvard University, laboratory facilities furnished by.....	12
Hawaii:	
Laboratory facilities furnished by.....	12
Operations of the service in.....	154
Health section of the League of Nations, cooperation with.....	9
Hoffman Island transactions, table showing.....	148
Hongkong, China, quarantine transactions at.....	168
Hospital division, report of:	
Abstract of field reports.....	225
Administrative headquarters, contract physician, table showing.....	219
Average per diem cost of in-patient relief, United States marine hospitals, chart showing.....	212
Causes of admission for discharged patients and condition on discharge, United States marine hospitals and other relief stations, fiscal year 1926, table showing.....	249-250
Causes of death in United States marine hospitals and other relief stations, fiscal year 1926.....	251-252
Classes of beneficiaries treated, Marine Hospital No. 43, fiscal year 1925.....	236
Classes of beneficiaries treated at Marine Hospital No. 43, fiscal year 1926.....	237
Classification of out-patient treatments furnished at United States marine hospitals and other relief stations, fiscal year 1926.....	257
Clinical information.....	222
Clinical work.....	215
Consolidated annual X-ray report, marine hospitals and second-class relief stations.....	218
Consolidated clinical laboratory report, for marine hospitals and second-class stations, table.....	216, 217, 218
Contract physicians.....	218
Construction and repair.....	224
Costs of out-patient relief.....	219
Dental unit.....	218
Disposition of surplus property.....	222
Economies.....	209
Foreign seamen.....	215
Instruction and examination of ships' officers in first aid.....	214
International conference on the health of merchant seamen.....	215
Lighthouse Service.....	214
Number of days in hospitals for patients discharged during fiscal year 1926 from United States marine hospitals and other relief stations, by broad groups of conditions and class of beneficiary.....	255-256
Number of patients of each class of beneficiary discharged from United States marine hospitals and other relief stations during fiscal year 1926, by broad groups of conditions.....	253-254
Number of patients treated annually, 1868 to 1926.....	243
Patients of United States Public Health Service in marine hospitals and relief stations, chart.....	221
Physical examinations.....	219
Radio medical advice to ships at sea.....	222
Relief furnished at United States marine hospitals and other relief stations, fiscal year 1926, classified by beneficiary.....	246-248
United States Coast Guard.....	210
United States Employees' Compensation Commission.....	213
Transactions at United States marine hospitals and other relief stations, fiscal year 1926.....	243-245
Transfer of surplus property, table.....	223
Windmill Point, proposed hospital at.....	224

	Page
Hospitals, summary of needs .....	225
Hygienic Laboratory:	
Biologic products, control of .....	63
Bulletins .....	208
Chemistry, division of .....	67
Infectious diseases, studies of .....	61
Miscellaneous .....	69
Number on duty .....	291
Nutritional diseases, studies of .....	61
Pathology and bacteriology, division of .....	61
Pharmacology, division of .....	66
State boards of health, cooperation with .....	69
Viruses, serums, toxins, and analogous products .....	69
Zoology, division of .....	65
I	
Illustrations:	
Ellis Island, Marine Hospital No. 43 .....	234
Stapleton, Marine Hospital No. 21 .....	233
Immigrants ( <i>see also</i> Aliens), medical inspection of .....	169-171
Immigration stations, report of transactions:	
Boston, Mass .....	179
El Paso, Tex .....	179
New York, N. Y .....	180
Noyes, Minn .....	180
Philadelphia, Pa .....	180
Philippine Islands .....	181
Port Huron, Mich .....	182
Presidio, Tex .....	182
San Francisco, Calif .....	183
Winnipeg, Manitoba, Canada .....	185
Improvements, chief clerk's office .....	299
Index catalogue of medical and veterinary zoology .....	65
Industrial and other agencies, cooperation with .....	49
Industrial hygiene and sanitation:	
Government departments, cooperation with .....	48
Industrial absenteeism, studies of causes .....	46
Industrial and other agencies, cooperation with .....	49
Occupational diseases, studies of .....	45
Occupational health hazards, surveys of .....	43
Statistical studies .....	47
Studies of .....	3
Tetraethyl lead, investigations of .....	42
Infection of rats .....	167
Influenza, prevalence of .....	19, 148, 200, 203
Inspection of aliens, medical .....	169-171
Institutions, correctional and penal .....	267
Instruction and examination of ships' officers in first aid .....	214
Interior, Department of, cooperation with .....	9
International Commission on Zoological Nomenclature, cooperation with .....	65
International Health Board, facilities for study granted representatives .....	12
International Institute of Statistics, cooperation with .....	12
International relations .....	136
International Sanitary Conference on the Health of Merchant Seamen .....	194
International Sanitary Office, Paris, cooperation with .....	9
Internes, number on duty .....	290
Interstate carriers, safe drinking-water supplies .....	5
Interstate quarantine:	
Report of division of .....	70
Activities recommended by the advisory committee on the education of sanitarians and the future of public health in the United States .....	131
Conference of the Surgeon General with State and Territorial health officers .....	132
Examination of rats, table showing .....	76, 77
Financial statement, fumigation (New Orleans), table showing .....	95
Interstate railroad water supplies .....	104



Interstate quarantine—Continued.	Page
Interstate sanitary districts	107
Interstate travel of diseased persons, supervision of	132
Interstate vessel water supplies	106
Mosquito control along the Texas-Mexican border	129
New Orleans, outgoing quarantine, field and laboratory operations, table showing	99
Plague eradivative measures in New Orleans, La.	91
Plague preventive measures, Seattle, Wash., table showing	100
Plague suppressive measures in California	70
Public health engineering abstracts, table showing	114
Railroad supplies, table showing	105
Railroad water-supply supervision, table showing summary of	111
Rural health work	128
Sanitation and medical assistance in the national parks	122
Sanitary inspection of shellfish areas	126
Trachoma eradication work	101
Typhoid-fever cases, table showing summary of	110
Vessel supplies, table showing	106
Vessel water-supply system, table showing	107
Vessel water-supply supervision, table showing summary of	110
Water supplies used by common carriers, supervision of	104
Water-supply systems on vessels, supervision of	106
Yellow-fever prevention, Texas-Mexican border, table showing summary of work	131
Interstate railroad water supplies	104
Interstate spread of disease, prevention of; rural sanitation	4, 5
Interstate travel of diseased persons, supervision of	132
Interstate vessel water supplies	106
Investigations ( <i>see also</i> Studies):	
Antidysenteric serums, standardization of	63
Black tongue	32
Cancer	12, 14, 15
Child health	2
Child hygiene	37
Clonorchiasis	16
Dental hygiene in school children	41
Epidemic encephalitis	62
Goiter	17, 19
Influenza	19
Leprosy	12, 23
Malaria control	4
Mental health	49
Milk	4, 50
Nutritional diseases	32
Pellagra	3, 32
Pneumonia	12
Racial mortality from cancer in the United States	15
Rocky Mountain spotted fever	35
Scarlet-fever preparations	64
Statistical	51
Tetraethyl lead	42
Tuberculosis	61
Vaccination sequelae	62

## J

Jacksonville, Fla., Relief Station No. 258	240
Johns Hopkins University, laboratory facilities furnished by	12
Justice, Department of, cooperation with	9

## K

Key West, Fla.:	
Quarantine station	139
United States marine hospital	228

## L

	Page
Labor, Department of, cooperation with.....	10
Laboratory division transactions, table showing.....	147
Laboratory examinations, table showing.....	184
Laboratory, Hygienic. ( <i>See</i> Hygienic Laboratory.)	
Laredo, Tex., report from continental quarantine station.....	153
Laws and regulations:	
State court decisions.....	268
State legislation.....	267
Lead analysis.....	68
League of Nations, health section.....	198
Legislation and decisions, sanitary:	
Comptroller General's decisions.....	203
Court decisions.....	203
Municipal ordinances and regulations.....	203
Smallpox vaccination laws, regulations, and court decisions.....	203
State and Federal laws and regulations.....	203
Leprosy:	
Clinical observations.....	23
Epidemiological studies.....	26
Investigation station.....	23
Prevalence of.....	150, 154, 160
Substitutions of oils.....	25
Library:	
Hygienic Laboratory.....	61
Public Health Service.....	299
Lighthouse Service.....	214
Los Angeles, Calif.:	
Plague in.....	70
Relief Station No. 266.....	240
Louisville, Ky., United States marine hospital.....	229

## M

Maintenance of marine hospitals, recommendations for.....	303
Malaria:	
Anopheline mosquitoes, studies of.....	29
Drainage studies.....	31
Epidemiological studies of.....	27
Fish control of mosquito production.....	28
Impounded waters, studies of.....	30
Prevalence of.....	27, 200, 202
Rural malaria control, studies of.....	28
Screening studies.....	31
Malaria control, investigations.....	4
Manila, P. I.:	
Relief Station No. 270.....	241
Quarantine transactions.....	158
Marcus Hook, Pa., quarantine station.....	139
Marine hospitals and relief, division of ( <i>see</i> Hospital division).....	209
Marine hospitals:	
Baltimore, Md.....	225
Boston (Chelsea), Mass.....	226
Buffalo, N. Y.....	226
Carville, La.....	238
Chicago, Ill.....	226
Cleveland, Ohio.....	227
Detroit, Mich.....	227
Ellis Island, N. Y.....	234, 235
Evansville, Ind.....	227
Fort Stanton, N. Mex.....	227
Key West, Fla.....	228
Louisville, Ky.....	229
Memphis, Tenn.....	229
Mobile, Ala.....	229
New Orleans, La.....	230

	Page
Marine hospitals—Continued.	
New York City.....	239
Norfolk, Va.....	239
Pittsburgh, Pa.....	231
Portland, Me.....	231
Port Townsend, Wash.....	231
Recommendations for maintenance of.....	303
St. Louis, Mo.....	231
San Francisco, Calif.....	232
Savannah, Ga.....	232
Stapleton, Staten Island, N. Y.....	232
Stapleton, illustration.....	233
Vineyard Haven, Mass.....	235
Measles, prevalence of.....	147, 183, 199-200
Medical and hospital relief.....	8
Memphis, Tenn., United States marine hospital.....	229
Mental health, investigations of.....	49
Mesa Verde National Park.....	125
Milk, investigations.....	4, 50
Milk sanitation, annual surveys of status of cities.....	51
Millbank Memorial Fund, cooperation with.....	12
Milwaukee, Wis., Relief Station No. 278.....	241
Miscellaneous publications.....	208
Mobile, Ala.:	
New quarantine station.....	134
United States marine hospital.....	229
Morbidity reports:	
Annual State reports.....	197
City reports.....	197
Collaborating and assistant collaborating epidemiologists.....	195
Foreign reports.....	198
Mentally diseased, feeble-minded, and epileptic.....	197
Monthly State reports.....	197
Prevalence of disease.....	6
Telegraphic reports, weekly.....	196
Morbidity statistics, studies.....	52
Mosquito control.....	124
Mosquito control along the Texas-Mexican border.....	129
Mosquito production, fish control of.....	28
Mosquitoes, anopheline studies.....	29
Mount Rainier National Park.....	125

## N

Narcotic addiction, studies of.....	2, 3
Nationalities represented by aliens, table showing.....	182
National monuments:	
Carlsbad Cave.....	126
Pinnacles.....	126
National Negro Business League, cooperation with.....	12
National Park Service, assistance rendered.....	5
National parks:	
Crater Lake.....	125
Glacier.....	125
Grand Canyon.....	124
Mesa Verde.....	125
Mount Rainier.....	125
Platt.....	125
Sanitation and medical assistance in.....	122
Sequoia and General Grant.....	125
Yellowstone.....	123
Yosemite.....	124
Zion.....	125
National quarantine service, recommendations for.....	303
National Safety Council, cooperation with.....	12
National Tuberculosis Association, conferences with.....	12
Negro children, mental and physical status of.....	37

New Orleans:	Page
Fumigation of vessels.....	93
Laboratory operations.....	92
Outgoing quarantine.....	93
Plague eradivative measures in.....	91
Port sanitary regulations.....	94
Quarantine station.....	140
Rodent catch.....	92
United States marine hospital.....	230
Newspapers and journals, education work with.....	262
New York, N. Y.:	
Immigration station.....	180
Quarantine station.....	141
United States marine hospital.....	239
Norfolk, Va., United States marine hospital.....	239
Noyes, Minn., immigration station.....	180
Number and percentage of applicants for immigration visas who were certified for different classes of disabilities, table showing.....	188
Number and percentage of immigration cases pending at the close of the fiscal year, table showing.....	190
Number and percentage of the total persons examined who were refused visas on medical certification for different classes of conditions, table showing.....	189
Number and percentage of the total persons certified for each class of disability who were refused visas on medical grounds, table showing.....	189
Number of aliens inspected and certified, tables showing.....	181
Number of days in hospital for patients discharged during fiscal year 1926 from United States marine hospitals and other relief stations, by broad groups of conditions and class of beneficiary, table showing.....	255-256
Number of patients admitted to Kalihi Hospital from July 1, 1925, to June 30, 1926, having children in household, table showing.....	26
Number of patients of each class of beneficiary discharged from United States marine hospitals and other relief stations, fiscal year 1926, by broad groups of conditions, table showing.....	253-254
Number of patients treated annually, 1868-1926, table showing.....	243
Nurses' quarters.....	301
Nursing, dietetic and reconstruction, report of section of.....	301
Nutritional diseases.....	3, 32
Nutrition, study of.....	66
O	
Oakland, Calif., plague in.....	86
Occupational diseases:	
Occupational dermatosis.....	46
Posture in industry.....	45
Occupational health hazards, surveys of:	
Dust studies.....	44
Studies in illumination.....	45
Ventilation studies.....	43
Officers ( <i>see also</i> Personnel):	
Commissioned medical, number on duty.....	289
Reserve, number on duty.....	290
Outgoing quarantine, field operations, etc., in New Orleans, table showing.....	99
Out-patient relief, costs of.....	219
Oxidation reduction.....	67
P	
Pamphlets, film showings, lectures, exhibits.....	263
Parasites, intestinal, examination for diagnosis.....	65
Paris, France, quarantine transactions at.....	164
Pathology and bacteriology, division of, Hygienic Laboratory.....	61
Pathology, studies in.....	65
Patients admitted to clinics, chart showing.....	267
Patients discharged as noninfectious, chart showing.....	267
Patients of United States Public Health Service in marine hospitals and relief stations, chart.....	221



	Page
Pellagra:	
Investigations	3
Prevalence of	200
Studies of	32
Pensacola, Fla., quarantine station	148
Percentage distribution of persons certified for disabilities according to class of condition, table showing	188
Permeability, study of	66
Perry Point, Md., supply station	242
Personnel ( <i>see also</i> Personnel and accounts):	
Force on duty in the bureau	299
Increase of	13
Recommendations for	304
Personnel and accounts, report of division of	282
Accounts section	291
Acting assistant surgeons	290
Attending specialists	290
Boards	291
Commissioned medical officers	289
Contract dental surgeons	291
Epidemiologists	291
Hygienic Laboratory	291
Internes	290
Personnel of the Public Health Service, June 30, 1926, table showing	293-298
Pharmacists and administrative assistants	291
Public health districts	285
Reserve officers	290
Personnel of the Public Health Service, June 30, 1926, table showing	293-298
Perth Amboy, N. J., quarantine station	148
Pharmacists and administrative assistants, number on duty	291
Pharmacology:	
Biological significance of glutathione and cystine	66
Cancer studies	66
Drug addiction	66
Drugs for treatment of syphilis, study of	66
Miscellaneous	67
Nutritional studies	66
Permeability studies	66
Philadelphia, Pa.:	
Immigration station	180
Relief Station No. 305	241
Philippine Islands:	
Diseases affecting	158, 159
Operations of the service in	158, 159
Report from immigration station	181
Physical examinations, general and special	219-220
Pinnacles National Monument	126
Pittsburgh, Pa., United States marine hospital	231
Plague:	
Endemic	77
Epizootic	78
Eradication of bubonic, in rodents	4
Eradicative measures in New Orleans, La.	91
Field operations for control of ground squirrels	87
Financial	95
Fumigation	81
Ground squirrels	82, 87
Laboratory operations in Los Angeles	74
Laboratory operations in New Orleans	92
Laboratory operations in San Francisco	90, 91
Los Angeles	70
Measures taken against rats	88
Oakland	86
Outgoing quarantine	93
Port sanitary regulations	94
Prevalence of	133, 158, 159, 160, 165, 167, 202

Plague—Continued.	Page
Prevention against	151
Preventive measures, Seattle, Wash.	100
Rat poisoning	80
Rat proofing	81, 82
Rodent catch	78
Rodent, control of	70
Sanitary inspections in San Francisco	89
Suppressive measures in California	70
Suppressive measures in cities and counties in vicinity of San Francisco Bay	87
Transportation	94
Trapping operations	78
Trapping operations in Los Angeles	78
Trapping operations in New Orleans	92
Wrecking operations	80
Platt National Park	125
Pneumonia:	
Prevalence of	200
Study of	63
Poliomyelitis, prevalence of	200
Port Arthur, Tex., Relief Station No. 309	241
Port Huron, Mich., immigration station	182
Port Townsend, Wash.:	
Quarantine station	148
United States marine hospital	231
Portland, Me., United States marine hospital	231
Porto Rico, operations of the service in	157
Post Office Department, cooperation with	9, 48
Presidio, Tex.:	
Immigration station	182
Quarantine station	154
Prevention of the interstate spread of disease; rural sanitation	4, 5
Printing and binding	299
Property, surplus, transfer of	283
Providence, R. I., quarantine station	148
Publications:	
Sanitary reports and statistics division	204
Scientific research division	69
Venereal-disease division	259, 261, 262
Public health bulletins	207
Public health districts	285
Public health education, section of	204
Public health engineering abstracts	114
Public Health Reports	204
Public Health Service, functions of	1

## Q

Quarantinable diseases	5, 133
Quarantine administration	141
Quarantine. (See also Interstate quarantine; Foreign quarantine.)	
Quarantine laws, violation of	136
Quarantine procedure, changes in	134
Quarantine service, recommendations for national	303
Quarantine services at maritime stations, bills rendered for	162, 163
Quarantine stations, insular, table showing transactions	154
Quarantine stations, reports from continental:	
Boca Grande, Fla.	138
Boston, Mass.	138
Cumberland Sound, Fla.	139
El Paso, Tex.	153
Key West, Fla.	139
Laredo, Tex.	153
Marcus Hook, Pa.	139
New Orleans, La.	140
New York, N. Y.	141

Quarantine stations, reports from continental—Continued.	Page
Pensacola, Fla.	148
Perth Amboy, N. J.	148
Port Townsend, Wash.	148
Presidio, Tex.	154
Providence, R. I.	148
Rio Grande and Roma, Tex.	154
Sabine, Tex.	149
San Diego, Calif.	150
San Francisco, Calif.	150
San Pedro, Calif.	152
Quarantine stations, reports from insular:	
Hawaii	154
Philippine Islands	158-159
Porto Rico	157
Virgin Islands	157
Quarantine transactions at foreign ports:	
Amoy, China	159, 166
Guayaquil, Ecuador	167
Habana, Cuba	167
Hongkong, China	168
Paris, France	164
Yokohama, Japan	168
Quarantine transactions, table showing summary of	169
Quarantine station, Mobile, Ala.	134
Quarantine system, Texas, acquisition of	135
Quarters, nurses'	301

## R

Radio medical advice to ships at sea	222
Rags, fumigation of	134
Railroad supplies, table showing	105
Railroad water-supply supervision	110, 113, 120, 122
Rat proofing of vessels	144-145
Rats:	
Eradicative measures	71-93, 95-98, 138, 143-146, 151, 160
Plague infected	167
Tables showing examination of	76, 77
Recommendations:	
Maintenance of marine hospitals	303
National quarantine service	303
Personnel	304
Scientific research	303
Regulations for the government of the United States Public Health	
Service revised	283
Regulations of interstate traffic in biologic products	3
Relapsing fever, prevalence of	202
Relief furnished at United States marine hospitals and other relief stations, classified by beneficiary, fiscal year 1926, table showing	246-248
Relief stations:	
Cairo, Ill.	239
Galveston, Tex.	240
Jacksonville, Fla.	240
Los Angeles, Calif.	240
Manila, P. I.	241
Milwaukee, Wis.	241
Philadelphia, Pa.	241
Port Arthur, Tex.	241
San Juan, P. R.	241
San Pedro, Calif.	242
Washington, D. C.	242
Reporting of venereal diseases	264
Report of clinics reporting to State boards of health, table showing	272,
	273, 274, 275, 276, 277, 278
Report of service operations in Europe, table showing	166
Report of 33 correctional and penal institutions, 1926, table showing	280

Reports:	Page
Annual State morbidity.....	197
City.....	197
Collaborating and assistant collaborating epidemiologists.....	195
Foreign.....	198
Mentally diseased, feeble-minded, and epileptic.....	197
Monthly State.....	197
Morbidity.....	195
Public Health.....	204
Telegraphic morbidity.....	196
Reprints from the Public Health Reports.....	205
Reserve officers, number on duty.....	290
Results of medical examinations of applicants for immigration visas for two periods and for the whole 11 months, table showing.....	191
Results of tests, Rocky Mountain spotted fever.....	35
Rio Grande and Roma, Tex., quarantine station.....	154
Rocky Mountain spotted fever:	
Epidemiological studies relating to distribution and incidence.....	36
Field investigations.....	35
Preparation of vaccine.....	34
Prevalence of.....	3
Results of tests.....	35
Study of.....	3, 33, 35, 61
Tests to determine effectiveness of vaccine.....	34
Rodents, eradication of bubonic plague in.....	4
Rural health work.....	4, 128
<b>S</b>	
Sabine, Tex., quarantine station.....	149
St. Louis, Mo., United States marine hospital.....	231
San Diego, Calif., quarantine station.....	150
San Francisco, Calif.:	
Immigration station.....	183
Quarantine station.....	150
Sanitary inspections in.....	89
United States marine hospital.....	232
San Juan, P. R., relief station No. 326.....	241
San Pedro, Calif.:	
Quarantine station.....	152
Relief station No. 355.....	242
Sanitary districts, interstate.....	107
Sanitary inspection of shellfish areas.....	126
Sanitary legislation and decisions.....	203
Sanitary reports and statistics, report of division of.....	195
Annual State morbidity reports.....	197
City reports.....	197
Collaborating and assistant collaborating epidemiologists.....	195
Comparison of cases of principal communicable diseases and deaths, 1925, table showing.....	199
Epidemiologists, collaborating and assistant collaborating, table showing.....	196
Foreign reports.....	198
Health information by radio.....	205
List of publications.....	205
Mentally diseased, feeble-minded, and epileptic.....	197
Monthly State reports.....	197
Morbidity reports.....	195
Prevalence of disease.....	199
Sanitary legislation and decisions.....	203
Section of public health education.....	204
Telegraphic morbidity reports.....	196
Sanitation and medical assistance in the national parks.....	122
Sanitation, annual surveys of milk status of cities.....	51
Sanitation, shellfish.....	5
Savannah, Ga., United States marine hospital.....	232
Scabies, prevalence of.....	183
Scarlet fever, prevalence of.....	3, 183, 200



	Page
Scientific research: Report of division of .....	14
Administrative health practice .....	36
Cancer .....	14
Child hygiene .....	37
Clonorchiasis .....	16
Cooperation with State boards of health .....	69
Distribution of mixed ethyl esters of chaulmoogra oil, table showing .....	25
Frequencies of 13 specified symptoms in respiratory attacks of different types as recorded by medical officers of the United States Army, Navy, and Public Health Service, for cases occurring in their families during 1924, table showing .....	22
Goiter .....	17
Hygienic Laboratory .....	60
Incidence of respiratory attacks of different types in families of medical officers of the United States Army, Navy, and Public Health Service, 1924, table showing .....	21
Industrial hygiene and sanitation .....	42
Influenza .....	19
Leprosy investigation station .....	23
Malaria .....	27
Mental health .....	49
Milk .....	50
Miscellaneous .....	69
Number of patients admitted to Kalihi Hospital from July 1, 1925, to June 30, 1926, having children in household, table showing .....	26
Nutritional diseases .....	32
Recommendations for .....	303
Rocky Mountain spotted fever .....	33
Statistical office .....	51
Stream pollution .....	56
Tests of biologic products, table showing .....	64
Thermo-anesthesia among groups of lepers, table showing .....	24
Variations according to age of respiratory diseases in families of medical officers of Army, Navy, and Public Health Service, 1924, chart showing .....	21
Viruses, serums, toxins, and analogous products .....	69
Screening studies .....	31
Seamen's Church Institute .....	239
Seattle, Wash., plague-preventive measures, showing water front, laboratory operations, and classification of rodents, table showing .....	100
Sequoia and General Grant National Parks .....	125
Shellfish:	
Sanitary control of .....	126
Sanitary inspection of .....	126
Sanitation .....	5, 111, 126
Shipping Board, United States, cooperation with .....	10
Sick benefit associations and medical departments of industrial establishments, cooperation with .....	12
Smallpox and vaccination .....	160, 166, 167, 168, 184, 192, 193, 219
Smallpox:	
In California .....	155
Prevalence of .....	2, 5-7, 84, 133, 139, 141, 148-150, 152-155, 157, 159-160, 165, 167-169, 201-202, 287-288
Prevention against .....	153
Social studies and investigations .....	261
Specialists. (See Attending specialists.) .....	
Specialists, attending, number on duty .....	290
Stapleton, Staten Island, N. Y., United States marine hospital .....	232
State and local health and other agencies, cooperation with .....	10
State, Department of, cooperation with .....	9
State health departments, cooperation with .....	258
State laws and regulations .....	267
State report of doses of arsphenamin (or similar product) administered, table showing .....	279
State report of educational activities, table showing .....	270
Statistical and epidemiological studies of specific diseases .....	53

	Page
Statistical office.....	51
Cooperation with other agencies.....	55
Work in association with other offices and divisions of the service.....	55
Statistical studies.....	47
Statistical summary of activities in the control of venereal diseases, table showing.....	280, 281
Statistics, comparable, of deaths.....	7
Stream pollution.....	56
Epidemiological study of typhoid fever.....	59
Experimental studies of the phenomena of natural purification.....	57
Field studies.....	56
Miscellaneous activities.....	59
Studies of the efficiency of water purification.....	58
Studies (see also Investigations):	
Anopheline mosquitoes.....	29
Antivenom.....	63
Biological significance of glutathione and cystine.....	66
Cancer.....	66
Causes of industrial absenteeism.....	46
Child health.....	2
Clonorchiasis.....	16
Diphtheria toxoid.....	64
Drainage.....	31
Drug addiction.....	63, 66
Drugs for treatment of syphilis.....	66
Dust.....	44
Epidemiological, relating to distribution and incidence Rocky Mountain spotted fever.....	36
Goiter.....	17
Goiter, field.....	4
Illumination.....	45
Impounded waters.....	30
Industrial hygiene and sanitation.....	3
Infectious diseases.....	61
Malaria.....	27
Miscellaneous.....	67
Morbidity statistics.....	52
Narcotic addiction.....	2, 3
Natural illumination of classrooms.....	39
Nutrition.....	66
Nutritional diseases.....	61
Occupational diseases.....	45
Pathology.....	65
Permeability.....	66
Pneumonia.....	63
Pollen extracts.....	64
Rocky Mountain spotted fever.....	3, 33, 61
Rural malaria control.....	28
Screening.....	31
Specific diseases, statistical and epidemiological.....	53
Statistical.....	47
Stream pollution.....	56
Tick and blood virus, Rocky Mountain spotted fever.....	35
Trachoma.....	63, 101-103
Tularaemia.....	61
Typhus fever.....	63
Ventilation.....	43
Vision of school children.....	40
Waters, impounded.....	30
Yellow fever.....	129
Summary of quarantine transactions, table showing.....	169
Summary of transactions at national (continental and insular) quarantine stations for the fiscal year, 1926, table showing.....	137, 138
Summary of vessel water-supply supervision.....	116, 120, 121
Superintendent of nurses, activities of.....	302
Supplements to the Public Health Reports.....	207

	Page
Supply station, Perry Point, Md.-----	242
Surgeons:	
Acting assistant, number on duty-----	290
Contract dental, number on duty-----	291
Surplus property, disposition of-----	222, 283
Surveys:	
Fleas-----	145-146
Occupational health hazards-----	43
Syphilis and gonorrhea, total cases reported to State boards of health, by months and years, chart showing-----	266

## T

## Tables (see also Charts):

Administrative headquarters, contract physicians-----	219
Alien passengers inspected and certified at all ports in the United States and its dependencies, and in Canada-----	172
Alien seamen inspected and certified at all ports in the United States and Canada-----	176
Bills rendered for quarantine services at maritime stations-----	162, 163
Cases of venereal disease reported to State boards of health-----	271
Causes of admission for discharged patients and condition on dis- charge, United States marine hospital and other relief stations--	249-250
Causes of death in United States marine hospitals and other relief stations-----	251-252
Classification of out-patient treatments furnished at United States marine hospitals and other relief stations-----	257
Comparative results of medical examinations of applicants for visas for different geographic areas-----	191
Comparison of cases of principal communicable diseases and deaths, 1925-----	199
Consolidated annual X-ray report, marine hospitals and second-class relief stations-----	218
Consolidated clinical laboratory report, marine hospitals and second- class stations-----	216-218
Dispensary and hospital relief, operations, etc., of trachoma-----	103
Distribution according to class of applicants for immigration visas who were medically examined at each station August 1, 1925, to June 30, 1926-----	187
Distribution of mixed ethyl esters of chaulmoogra oil-----	25
Educational pamphlets and placards purchased and reprinted by State boards of health-----	268, 269
Epidemiologists, collaborating and assistant collaborating-----	196
Examination of rats-----	76, 77
Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health-----	269
Financial statement, fumigation (plague operations in New Orleans) -----	95
Frequencies of 13 specified symptoms in respiratory attacks of differ- ent types as recorded by medical officers of the United States Army, Navy, and Public Health Service, for cases occurring in their families during 1924-----	22
Hoffman Island transactions-----	148
Incidence of respiratory attacks of different types in families of medical officers of the United States Army, Navy, and Public Health Service, 1924-----	21
Laboratory division transactions-----	147
Laboratory examinations-----	184
Nationalities represented by aliens-----	182
New Orleans, outgoing quarantine, field operations, and laboratory operations-----	99
Number and percentage of applicants for immigration visas who were certified for different classes of disabilities-----	188
Number and percentage of immigration cases pending at the close of the fiscal year-----	190
Number and percentage of the total persons certified for each class of disability who were refused visas on medical grounds-----	189

## Tables (see also Charts)—Continued.

	Page
Number and percentage of the total persons examined who were refused visas on medical certification for different classes of conditions.....	189
Number of aliens inspected and certified.....	181
Number of days in hospital for patients discharged from United States marine hospitals and other relief stations, by broad groups of conditions and class of beneficiary.....	255-256
Number of patients admitted to Kalihi Hospital from July 1, 1925, to June 30, 1926, having children in household.....	26
Number of patients of each class of beneficiary discharged from United States marine hospitals and other relief stations, by broad groups of conditions.....	253-254
Number of patients treated annually, 1868 to 1926.....	243
Percentage distribution of persons certified for disabilities according to class of condition.....	188
Personnel of the Public Health Service, June 30, 1926.....	293-298
Plague-preventive measures, Seattle, Wash.....	100
Public health engineering abstracts.....	114
Quarantine transactions on the Texas-Mexican border.....	153
Railroad supplies.....	105
Relief furnished at United States marine hospitals and other relief stations, classified by beneficiary.....	246-248
Report of clinics reporting to State boards of health.....	272,
	273, 274, 275, 276, 277, 278
Reporting of service operations in Europe.....	166
Report of 33 correctional and penal institutions.....	280
Results of medical examinations of applicants for immigration visas for two periods and for the whole 11 months.....	191
States ranked according to the monthly and daily new admissions per clinic.....	279
States ranked according to the percentage of increase or decrease in the number of cases of venereal disease reported to State boards of health.....	272
State report of doses of arsphenamin (or similar product) administered.....	279
State report of educational activities.....	270
Statistical summary of activities in the control of venereal diseases.....	280, 281
Summary of quarantine transactions.....	169
Summary of railroad water-supply supervision.....	111
Summary of transactions at national (continental and insular) quarantine stations.....	137, 138
Summary of typhoid-fever cases.....	110
Summary of vessel water-supply supervision.....	110
Tests of biologic products.....	64
Thermo anesthesia among groups of lepers.....	24
Transactions at continental quarantine stations.....	137
Transactions at foreign ports, summary of.....	163
Transactions at Habana, Cuba.....	167
Transactions at insular quarantine stations.....	154
Transactions at United States marine hospitals and other relief stations.....	243-245
Transfer of surplus property.....	223
Vaccination history and the occurrence of vermin infestation of applicants for immigration visas.....	193
Vessel supplies.....	106
Vessel water-supply system.....	107
Yellow-fever prevention, Texas-Mexican border, summary of work.....	131
Tests of biologic products, table showing.....	64
Tests to determine effectiveness of vaccine, Rocky Mountain spotted fever.....	34
Texas border stations, quarantine, table showing transactions.....	153
Texas quarantine system, acquisition of.....	135
Thermo-anesthesia among groups of lepers, table showing.....	24
Total relief and physical examinations furnished from 1915 to 1926 to "old line" Public Health Service beneficiaries.....	211



	Page
Trachoma:	
Dispensary and hospital relief, operations, etc., tables showing-----	103
Eradication work-----	101
Eveleth, Minn.-----	101
Knoxville, Tenn., hospital at-----	101
Prevalence of-----	63, 101-103, 202
Rolla, Mo., hospital at-----	101, 102
Russellville, Ark., hospital at-----	101
Study of-----	63
Transfer of surplus property-----	222, 283
Transfer of surplus property, table showing-----	223
Tuberculosis:	
Prevalence of-----	201
Study of-----	61
Tularemia:	
Prevalence of-----	76
Study of-----	61
Typhoid fever:	
Death rates-----	7
Prevalence of-----	2, 107, 109, 113, 115, 118, 128, 201
Table showing summary of-----	110
Vaccination-----	219
Typhus fever:	
Prevalence of-----	5, 134, 153, 154, 160, 165, 202
Prevention against-----	153
Study of-----	63

## V

Vaccination:	
Smallpox-----	7, 160, 166, 167, 168, 184, 192, 193, 219
Typhoid fever-----	219
Vaccination history and the occurrence of vermin infestation of applicants for immigration visas, table showing-----	193
Vaccination sequelae, study of-----	62
Vaccine, preparation of, Rocky Mountain spotted fever-----	34
Variations according to age of respiratory diseases in families of medical officers of Army, Navy, and Public Health Service, 1924, chart showing-----	21
Venereal diseases, report of division of-----	258
Cases of syphilis and gonorrhea reported to State boards of health, by months, chart showing-----	265
Cases of venereal diseases reported to State boards of health, chart showing-----	264
Cases of venereal diseases reported to State boards of health, table showing-----	271
Clinical studies and investigations-----	260
Clinics-----	265
Cooperative work with the State health departments-----	258
Correctional and penal institutions-----	267
Educational pamphlets and placards purchased and reprinted by State boards of health, table showing-----	268, 269
Education work with newspapers and journals-----	262
Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health, table showing-----	269
Pamphlets, film showings, lectures, exhibits-----	263
Patients admitted to clinics, chart showing-----	267
Patients discharged as noninfectious, chart showing-----	267
Report of clinics reporting to State boards of health, table showing-----	272, 273, 274, 275, 276, 277, 278
Publications-----	262
Report of 33 correctional and penal institutions, table showing-----	280
Reporting of venereal diseases-----	264
Social studies and investigations-----	261
State laws and regulations-----	267
State report of doses of arsphenamin (or similar product) administered, table showing-----	279

Venereal diseases, report of division of—Continued.	Page
State report of educational activities, table showing	270
States ranked according to the monthly and daily new admissions per clinic, table showing	279
States ranked according to the percentage of increase or decrease in the number of cases of venereal disease reported to the State boards of health, table showing	272
Statistical summary of activities in the control of venereal diseases, table showing	280, 281
Syphilis and gonorrhea, total cases reported to State boards of health by months and years	266
Work with the colored population	263
Vessel supplies, table showing	106
Vessel water supply and sanitation supervision	112, 114, 121
Vessel water-supply system, table showing	107
Vessels:	
Fumigation of	93, 94, 133-134, 138-141, 143-144, 148-151, 157, 161
Rat proofing of	144-145
Table showing supplies	106
Veterans' Bureau, cooperation with	10
Vineyard Haven, Mass., United States marine hospital	235
Violation of quarantine laws	136
Virgin Islands, operations of the service in	157
Viruses, serums, toxins, and analogous products	69

## W

War and Navy Departments, cooperation with	9
Washington, D. C., Relief Station No. 339	242
Water supplies:	
Interstate carriers	5
Interstate railroads	104
Interstate vessels	106
Water-supply supervision:	
Railroads	110-113, 120, 122
Cooperation with State health departments	116, 120, 122
Table showing summary of	111
System on vessels	106, 108, 112
Vessels	110, 112, 114, 116, 117, 120, 121
Waters, impounded, studies	30
Welfare activities	231, 232
Whooping cough, prevalence of	183, 201
Windmill Point, proposed hospital at	224
Winnipeg, Canada, report from immigration station	185

## Y

Yellow fever:	
Prevalence of	129, 130, 134, 154, 160, 202
Prevention, Texas-Mexican border, table showing summary of work	131
Yellowstone National Park	123
Yokohama, Japan, quarantine transactions at	168
Yosemite National Park	124

## Z

Zion National Park	125
Zoology, division of, Hygienic Laboratory	65