

ANNUAL REPORT
OF THE
SURGEON GENERAL OF THE
U.S. PUBLIC HEALTH SERVICE
OF THE UNITED STATES

FOR THE FISCAL YEAR
1931



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TREASURY DEPARTMENT

Document No. 3042

Public Health Service



UNITED STATES
DEPARTMENT OF HEALTH AND HUMAN SERVICES
WASHINGTON, D. C.

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LETTER OF TRANSMITTAL

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, December 7, 1931.

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 1931.

Respectfully,

A. W. MELLON,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

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The following is a list of the names of the persons who have been
 appointed to the various offices of the Board of Education for the
 year 1875-76. The names are given in the order in which they
 were appointed, and are followed by the names of the persons who
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ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, October 15, 1931.

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 transactions of the Public Health Service of the United States for the fiscal year ended June 30, 1931. This is the sixtieth annual report of this service, covering the one hundred and thirty-third year of its existence.

The Public Health Service is charged by law with the prevention of the introduction and spread of infectious diseases from foreign countries into the United States. This is one of the important public health duties of the Federal Government. The relation of commerce in connection with the spread of epidemic diseases is well known. In carrying out the requirements of law with reference to the defense of our territory from invasion by contagious diseases from foreign countries, especially in view of the new problems occasioned by the rapid increase of international aerial transportation, it is important to keep currently advised as to the prevalence of disease not only in the United States but throughout the world, in so far as may be practicable.

WORLD HEALTH CONDITIONS

As heretofore, during the past fiscal year there was a constant interchange of sanitary information with other nations of the world through the International Office of Public Hygiene of Paris, the Pan American Sanitary Bureau, and the health section of the Secretariat of the League of Nations. Useful epidemiological intelligence was also received by the Public Health Service through American consuls, officers of the service stationed abroad, and directly from foreign governments.

International sanitary agreements—the International Sanitary Convention of Paris and the Pan American Sanitary Code—have operated to improve the promptness and completeness of the information relating to the prevalence of disease received from various foreign governments.

Cholera did not appear in continental United States, but an outbreak began in the Philippine Islands in May, 1930, and continued throughout the fiscal year, although during May and June, 1931, the number of cases and deaths was comparatively small. During the calendar year 1930 about 4,600 cases of cholera, with about 2,700 deaths, were reported in the Philippines. Cholera appears every year in parts of Asia, and under present conditions outbreaks in the

Philippine Islands may be expected; but the numbers of cases and deaths are much smaller than they were a few decades ago.

Cholera was more prevalent during the calendar year 1930 than it was during 1929, although in 1930 it was not reported outside of Asia and the adjacent islands. In India 366,951 cases of cholera were reported in 1930 and 285,792 cases in 1929.

During the calendar year 1930 plague in human beings was not reported in the United States or its possessions, but one plague-infected rat was found in the Hamakua district of the island of Hawaii. In May, 1931, another plague-infected rat was found in the same district, and in May and June, 1931, 6 plague-infected ground squirrels were reported from Monterey County, Calif., in a locality where intensive squirrel-destruction work was being carried on in the endeavor to stamp out plague in rodents.

In South America plague was reported during the calendar year 1930 in Brazil, Ecuador, Peru, and Argentina. Over the world generally plague was as widespread as it has been in recent years, although the total number of reported cases was smaller than it was in 1929. In 1930, 35,644 cases of plague were reported in India, as compared with 97,346 cases in 1929.

During the fiscal year yellow fever was present in Brazil, in South America, and in the Gold Coast and British Cameroons, in Africa. One case was reported at Lagos, Nigeria, which was said to have been infected in a laboratory. The disease was not reported in the city of Rio de Janeiro, Brazil, nor in Colombia during the fiscal year, although four cases were reported in Magdalena Province, Colombia, in July, 1931.

Soon after the close of the fiscal year, in July and August, 1931, cases of yellow fever were reported in Africa and in Brazil.

The world prevalence of typhus fever has been decreasing since the decline of the great epidemics which followed the World War. The disease, however, is still reported from all the grand divisions of the world. The largest number of cases is reported by the Union of Soviet Socialist Republics.

During the calendar year 1930 there were 510 cases of typhus fever reported to the Public Health Service from the United States; 474 of these cases were in States south of Pennsylvania and the Ohio River and east of the Mississippi. Nearly all of the typhus fever in the United States is the mild type, formerly known as "Brill's disease," now sometimes spoken of as endemic typhus, but the virulent type is always present in Mexico, and sometimes this type of the disease appears in the southwestern part of the United States.

Smallpox is widespread, and during the calendar year 1930 there were cases of the disease reported from nearly all of the countries of the world, although most of the countries of western Europe reported comparatively few cases. England and Wales reported 11,865 cases in 1930, as compared with 10,989 cases in 1929. The disease in England, as in the United States, is mild in type, and there is strong opposition in certain quarters to vaccination. In 1930 England and Wales reported more cases of smallpox than did all the countries of continental Europe, and the United States reported more cases than any other single country, with the exception of British India.

HEALTH CONDITIONS IN THE UNITED STATES

Reports of the prevalence of communicable diseases received by the Public Health Service from State health officers and preliminary reports of deaths from several sources indicate that the health record for the United States for the calendar year 1930 was exceptionally good. The record for the first half of the year 1931 was also generally good, although an epidemic of mild influenza during the early months of 1931 increased the death rates for a time and gave the year an inauspicious beginning.

The geographic distribution of smallpox in the United States is very irregular. Seven States—Connecticut, Delaware, District of Columbia, Maine, Maryland, New Hampshire, and Rhode Island—reported no case of smallpox in 1930. The greatest prevalence of smallpox that year was in South Dakota, with 259 cases per 100,000 population. Indiana reported 164 cases of smallpox per 100,000 population, and the State of Washington 152 cases per 100,000.

During the calendar year 1930 the incidence of influenza in the United States was unusually low. The death rate from influenza for the year 1930 was 18.7 per 100,000 population, as compared with 54.6 per 100,000 in 1929 and 42.1 in 1928. The death rates per 100,000 population from influenza and pneumonia combined for these three years were as follows: 1930, 101.8; 1929, 149; 1928, 143.2.

The fact that there was no general outbreak of influenza during 1930 probably helped greatly in keeping the general death rate for the year low, as there is usually an increase in the number of deaths attributed to certain other diseases when influenza is prevalent.

Infantile paralysis was more prevalent during the calendar year 1930 than it was in 1928 or 1929. In the spring of 1930 the reports showed increased incidence of infantile paralysis on the Pacific coast, and later considerable numbers of cases of the disease were reported in other parts of the country, especially in Louisiana, Oklahoma, and some of the North Central States. In the country as a whole infantile paralysis reached its peak for the year about the 1st of October. An outbreak began in New York City soon after the close of the fiscal year.

The tuberculosis death rate for the calendar year 1930 was the lowest ever recorded by the Public Health Service. It was 68.5 deaths per 100,000 population, as compared with 73.1 in 1929 and 76.4 in 1928. In 1900 the Census Bureau recorded a death rate from tuberculosis of 201.9 per 100,000 population. The difference between the tuberculosis death rates of 1900 and 1930 represents a saving of more than 160,000 lives in 1930, which would have been lost from tuberculosis in the United States if the 1900 rate had prevailed that year.

The prevalence of typhoid fever has been decreasing in the United States since comparable yearly statistics of cases and deaths have been available. During the calendar year 1930, a slight reaction was shown by the reports. The increase was reported during the last six months of 1930, and in some States, at least, it may have been influenced by the drought conditions, which resulted in pollution of water supplies or necessitated the taking of drinking water

from new or unknown sources. The typhoid fever case rates, as computed from reports to the Public Health Service, were as follows:

	Cases per 100,000 population
1930-----	22.0
1929-----	19.0
1928-----	22.7

Ten years earlier, 1920, the typhoid fever case rate was 38.5 per 100,000 population.

The case and death rates for diphtheria in 1930 were the lowest which the Public Health Service has ever recorded—54.2 cases and 4.9 deaths per 100,000 population. Ten years ago, in 1920, the diphtheria case rate was 155 per 100,000 and the death rate was 15.3 per 100,000.

From 1924 to 1928 there was an increase in the prevalence of pellagra in the United States. In 1929 the reported incidence of the disease decreased somewhat, and there was a further decrease during the year 1930. During the first six months of 1931, however, 16,385 cases of pellagra were reported to the Public Health Service, as compared with 13,359 cases reported during the first six months of the preceding year.

Tularaemia was reported during the calendar year 1930 from all of the States except Maine, New Hampshire, Vermont, Connecticut, Rhode Island, and Arizona. Massachusetts reported one case of the disease. The reports are incomplete, but a total of 660 cases of tularaemia was reported.

From 1924 to 1929 there was a steady increase in the incidence of meningococcus meningitis in the United States. During the year 1930, however, there was a decrease as compared with the figures for the preceding year. In 1930, 7,747 cases of meningococcus meningitis were reported to the Public Health Service; in 1929, 9,584 cases; and in 1928, 5,252 cases.

More than 1,450 cases of undulant fever were reported to the Public Health Service for the calendar year 1930. The disease has been recognized in every State of the Union.

Rocky Mountain spotted fever is not reportable in many of the States east of the Rocky Mountains. In 1930, 167 cases were reported in California, Colorado, Idaho, Montana, Nevada, Oregon, Washington, and Wyoming. During the year workers of the Public Health Service identified, by laboratory and clinical studies, Rocky Mountain spotted fever, eastern type, in several States along the Atlantic seaboard. There is evidence to indicate its existence in this area at least since 1909. In 1931 cases were reported in the District of Columbia and Maryland.

PREVENTION OF THE INTRODUCTION OF DISEASES FROM ABROAD

During the fiscal year no instance occurred of the importation from abroad of any quarantinable disease into the United States. Four cases of smallpox reached our quarantine stations and were detained. Two cases of cholera occurred on interisland vessels in the Philippine Islands.

At the beginning of the fiscal year cholera was present in epidemic form in several of the islands in the Visayas. There was also a

minor epidemic in the city of Manila, some 50 cases occurring there. Interisland quarantine was put into effect against several ports, effective at various times during the year, viz, Manila, Cebu, Iloilo, the Province of Iloilo, the Province of Capiz, the island of Bohol, and the island of Samar. This epidemic, however, can not be attributed to any recent importation, as past history shows that cholera recurs in epidemic form in these islands every four or five years and may be considered as endemic there.

Health conditions reported during the year regarding the possible presence of yellow fever near certain ports of South America on the Carribbean coast, particularly the western part, and on the east coast from the Amazon River to Rio de Janeiro, were such as to warrant the issuance of instructions to quarantine officers at stations located on the Gulf and Atlantic coasts south of the southern boundary of Maryland to be on the alert in making the quarantine inspection of vessels which have called at these ports, especially at the smaller ports along the east coast of South America. The port of Para (Belem) at the mouth of the Amazon River is regarded as infected, and scattered cases have been reported at various interior points more or less close to several of the seaports along the coast. It is understood that the Brazilian authorities are maintaining an effective antimosquito campaign in the principal seaports and that danger of maritime spread is decreased accordingly. Information has also been received from reliable unofficial sources indicating the occurrence of suspected cases of yellow fever in the interior of Colombia in the region of Santa Marta and Barranquilla, but as yet these reports lack official confirmation.

At domestic ports during the year 14,955 vessels, 773,743 passengers, and 1,039,524 seamen were inspected on arrival by quarantine officers; at insular ports 3,417 vessels, 161,037 passengers, and 235,537 seamen were inspected; and at foreign ports 4,132 vessels, 365,194 passengers, and 316,711 seamen were inspected prior to embarking for the United States.

Of the passengers who embarked at European ports, 41,737 were vaccinated and 38,639 were deloused under the supervision of medical officers of the service. Clothing and baggage of these passengers, amounting to 54,763 pieces, were disinfected.

A total of 4,072 vessels were fumigated either because of the occurrence of disease aboard or for the destruction of rats as a plague-preventive measure. Of the rodents recovered following fumigation, 6,073 were examined for evidence of plague infection.

While Executive Order No. 5143, approved June 21, 1929, restricting for the time being the transportation of passengers from certain ports in the Orient, remained in force during the fiscal year 1931 the regulations prescribed in accordance with the provisions of this Executive order have been modified from time to time as conditions warranted, so that now the very minimum requirements are imposed and no undue hardship results. In connection with the occurrence of cases of cerebrospinal meningitis among steerage passengers on vessels en route from oriental ports, the Public Health Service is now conducting a study of ventilation and berthing facilities on vessels of a steamship line engaged in the carriage of oriental steerage to United States ports. These studies are being conducted jointly

by representatives of the Public Health Service, the steamship line medical service, and the University of California.

The problem of the sanitary control of aerial navigation has been receiving international attention for several years, finally culminating in a proposed international convention for the sanitary control of aerial navigation. This proposed convention formed the principal topic for discussion at the last two meetings of the permanent committee of the Office International d'Hygiene publique, in Paris, October, 1930, and May, 1931, as well as at the meeting in April, 1931, of the Second Pan American Conference of Directors of Health held in Washington, D. C., under the auspices of the Pan American Sanitary Bureau. Thus the views of the two most important international health bodies were incorporated in a final draft as adopted by the permanent committee of the Office International d'Hygiene publique at its meeting in Paris in May, 1931.

Of international interest also is the problem of the control of psittacosis. This subject will form one of the major topics for discussion at the forthcoming meeting of the permanent committee of the Office International d'Hygiene publique in Paris in October, 1931. The regulations of the United States for the control of this disease, prescribed in accordance with Executive Order No. 5264, issued by the President on January 24, 1930, restricting for the time being the introduction of parrots into the United States, have been modified during the past year to permit the importation of commercial shipments of these birds under approved sanitary restrictions relating to crates, air space, and other conditions of transportation. This step was taken after very careful deliberation on the part of the Public Health Service and after a conference with representatives of the Pet Dealers Association of America and members of the Biological Survey of the United States Department of Agriculture.

During the past year a change has been made in the application of the measures designed to prevent the spread of typhus fever at ports of embarkation. This step was taken in view of the better organization of sanitary services and improvement in sanitary conditions now obtaining throughout Europe. Where formerly the application of the measures designed to prevent the spread of typhus fever were based upon broad geographic areas, now their application is contingent upon the actual endemic or epidemic prevalence of typhus fever in such ports, places, or areas from which persons destined for the United States have originated or embarked.

During the fiscal year the special studies of the fumigation of ships as a plague-preventive measure, which were begun last year at the New York quarantine station, were continued with marked progress. A summary of these investigations has been prepared for the information of the members of a special commission to make a study of the fumigation of vessels, appointed by the health section of the League of Nations, which will visit the United States during the autumn, to study methods in use at United States ports, with particular reference to the fumigation of ships with various forms of hydrocyanic acid upon arrival from plague-infected ports while cargo laden.

MEDICAL EXAMINATION OF ALIENS

At domestic ports, 761,436 alien passengers and 916,868 alien seamen were examined by medical officers under the immigration laws. Of this number, 19,962 passengers and 1,597 seamen were certified for various diseases and disabilities. The most important causes and the numbers of aliens certified therefor were as follows: Trachoma, 340; tuberculosis, 181; feeble-mindedness, 114; insanity, 75; syphilis, 281; gonorrhoea, 315. Of the alien seamen examined, 21 were certified for trachoma, 26 for tuberculosis, 178 for syphilis, 178 for chancroid, and 447 for gonorrhoea.

There has been no material change during the past year in the system of making medical examinations of applicants for immigration visas in their countries of origin in Europe. On July 1, 1930, an office was opened in the American consulate at Vienna, Austria, where applicants are medically examined before visas are granted. The system of the medical examination of applicants for visas at consulates was inaugurated during the past year in other foreign countries, viz, Canada, Mexico, and Cuba. At several of the Canadian stations medical officers of the Public Health Service are performing the medical examination of intending immigrants for both the local office of the Immigration Service of the United States Department of Labor and for the Department of State.

During the fiscal year ended June 30, 1931, a total of 103,078 applicants for immigration visas were given medical examination in the country of origin. Of this number, 79,058 were examined by medical officers of the service attached to American consulates in Europe; 15,080 of these, or 19.7 per cent, were found to have mental or physical defects; 7,413, or 9.6 per cent of the total examined, were refused visas for medical reasons. Of 94,412 aliens who had been given a preliminary medical examination abroad and to whom visas had been issued, only 11 were finally certified upon arrival at a United States port as being afflicted with class A diseases, resulting in mandatory deportation.

PREVENTION OF THE SPREAD OF CONTAGIOUS AND INFECTIOUS DISEASES
IN INTERSTATE COMMERCE

During the year changes in procedure in carrying out the certification of drinking-water supplies used by common carriers and vessel water-supply systems tended to increase the efficiency of this work. Approximately 87.5 per cent of 2,275 drinking-water supplies used on interstate trains and 88 per cent of the 243 supplies on interstate vessels were inspected and reported upon. Of the 2,118 vessels listed as engaged in interstate traffic, 1,124 were inspected, and of these 893 were given favorable certification. With the continuance of the procedure now in force it is believed that the percentage of water supplies supervised and controlled will be materially increased. With more frequent yearly inspections of vessels the interest of operating companies is maintained, resulting in fewer violations once a vessel has met the requirements.

The present method of control over shellfish sanitation has been reasonably satisfactory, but some change in the procedure is being

considered whereby this control may be improved. In Massachusetts approval has been given tentatively for the interstate shipment of clams conditioned in water made sterile by chlorine, provided that the plants are operated under State supervision. Three conditioning plants are already in operation in Massachusetts, and a fourth one is under construction. Further study of methods of conditioning are necessary, but the process is one presenting many possibilities.

Cooperation with other governmental bureaus and agencies in connection with advice and assistance in sanitary engineering and sanitation problems increased during the year. This work has become a very appreciable part of the activities of the sanitary engineers of the service, occupying 31 per cent of the time of the field force.

At the request of the Commissioners of the District of Columbia and the Director of Public Buildings and Public Parks, the service has undertaken the coordination and supervision of mosquito control work in the District of Columbia. The number of agencies involved somewhat complicates the problem, but the cooperation received and the interest taken have made possible fairly effective control during this first year.

Regular cooperative rural sanitation demonstration projects were conducted in 223 counties in 28 States. On January 1, 1931, a survey made by the Office of Rural Sanitation showed that there were 557 counties with full-time health service in the United States. This represented a gain of 52 over the preceding year.

On February 6, 1931, Congress appropriated to the Public Health Service the sum of \$2,000,000 for emergency health work in the drought-stricken areas. In carrying out this work a modification of the plan used for the regular cooperative rural sanitation activities was adopted, with the result that details of administration were quickly worked out with the States, and field projects were under way within a short time. By June 30, 1931, there were in operation in the 16 States within the drought areas 333 field organizations, including projects covering 395 counties. The work carried on has consisted in the activities usually conducted by full-time county health units, with special emphasis upon the prevention of communicable diseases by general immunization, the sanitation of milk and water supplies, the improvement of excreta disposal conditions, and attention to the health of infants, children, and mothers. It is believed that many of the temporary units organized will serve to stimulate the establishment of permanent health departments supported with local funds in the future.

Trachoma-eradication work was continued at Rolla, Mo., Knoxville, Tenn., and Richmond, Ky. Following the prevalence survey made by the Public Health Service at the request of the State commissioner of health of Georgia, arrangements were made for the opening of a treatment center at Bainbridge, in Decatur County. The work carried on in the several States included not only operations upon cases in dispensaries and hospitals, but searches for affected individuals, follow-up visits, and general educational activities carried on in the rural sections by public health nurses attached to the clinics. A total of 66,000 individuals were examined in schools,

homes, field clinics, and dispensaries. There were 1,196 operations and 8,380 other treatments given to 3,895 cases seen.

Plague-eradication activities included intensive rodent control measures carried on in cooperation with State and local authorities in four California counties—Alameda, Contra Costa, San Francisco, and San Mateo. In addition to the work done by the Public Health Service in these four counties, a large amount of ground squirrel eradication work was carried on by the county horticultural commissioners and the State health department in other localities. Two new foci of plague in ground squirrels were found in Monterey County. Rodent surveys, trapping operations, sanitary inspections, and laboratory examinations were continued in San Francisco. Approximately 36,000 rats trapped in San Francisco and Oakland were examined. No case of plague infection was found among the rats examined during the year.

INVESTIGATIONS OF PUBLIC HEALTH PROBLEMS

The appropriation available for cancer has permitted the expansion and reorganization of the work along the following lines:

Studies at the cancer investigation station located at the Harvard Medical School, Boston, Mass., are divided as follows:

(1) Studies of the biological effects of radiation. This includes the investigation of the biological action of the whole spectrum of radiation, from the highest-frequency X rays to electromagnetic radiation.

(2) Studies of resistance and immunity to malignant growths. Experiments have shown that mice bearing the strain of mouse sarcoma designated as No. 180, rats bearing rat sarcoma No. 10, or chickens bearing the Rous fowl sarcoma, which had recovered from these tumors as the result of treatment with high-frequency currents are frequently resistant to reinoculation. In the case of mouse sarcoma No. 180, if this be inoculated into the tail of the animal the tumor grows much more slowly than when implanted in the usual sites of the groin or the axilia. The diminished rate of growth gives time for fuller development of the tumor. If, then, after suitable interval, the tail tumor is destroyed by the application of high-frequency currents or amputated, in about 70 per cent of the cases the animal is found to be immune to reimplantation in the usual site.

(3) Study of the biochemistry of malignant cells. Efforts will be directed toward an intensive study of the inorganic constituents of malignant as compared with normal cells, particularly with reference to inorganic constituents which are present in minimum amounts.

(4) Studies of susceptibility to malignant growths and its modification. Experiments are now under way designed to study the modifying effects, if any, of certain procedures on the tumor rate. Sufficient time has not yet elapsed to determine the outcome of these experiments.

Studies at the National Institute of Health relate particularly to the factors concerned in the growth of normal cells and cancer cells. This is of fundamental importance, since an outstanding character-

istic of cancer cells is their unrestrained proliferation in the human and animal body. It has been shown that glutathione apparently plays an important function in cellular metabolism, and its effect on cell division has emphasized the need for further chemical and biochemical knowledge of this substance. Measurement of the hydrogen-ion concentration of tumors is of value in work on cultures of malignant and normal tissues, so work is being done on the development of a microelectrode suitable for such measurement.

The treatment of leprosy patients at the station in Hawaii continued to be directed mainly toward determining and relieving abnormal conditions and applying general therapeutic measures, since experience has shown that attempts to treat leprosy specifically with any known remedy is productive of only indifferent results.

The continuous and intermittent dusting studies for the control of the *Anopheles* mosquito, begun in the early summer of 1929, were continued during the present fiscal year. The results of this year's progress indicate a considerable degree of success.

Special studies have been conducted in the bionomics both of malaria and of its vector, the *Anopheles* mosquito, in an effort to develop a biological attack against the disease.

A new study has been undertaken to determine the best method of transmitting a pure strain of benign tertian malaria to various institutions for the insane to be used in the treatment of paresis.

Studies in nutrition have consisted largely of the determination of the relative pellagra-preventive potency of single staple food and foodstuffs. A study of canned spinach showed it to contain the anti-pellagic vitamins, but not to a degree sufficient for complete protection against the disease, while canned turnip greens gave complete protection. Canned green stringless beans were shown to be a relatively poor source of the anti-pellagic vitamin. The determination of the pellagra-preventive value of canned foodstuffs is of immense practical value, since they may be obtained at the time of the year when the diet is most restricted and pellagra is most prevalent.

Studies of the fatty degeneration of the liver in dogs have been completed, and the results indicate that the condition is probably due to some dietary deficiency.

The increasing knowledge of the extent and importance of tick-borne diseases in this country, and particularly of Rocky Mountain spotted fever, has led to the need for additional space, which has been met by the act of Congress approved February 27, 1931, providing for the purchase of the Montana State Board of Entomology Laboratory located at Hamilton, Mont., and for the construction of a new laboratory building.

The amount of Rocky Mountain spotted fever vaccine manufactured has been doubled during each of the past four years. The season of 1931 is the first since the use of the vaccine was begun in 1925 during which it has been possible to fill all requests. There were 54.1 liters distributed, as compared with 31.2 in 1930. It seems certain that the demand for vaccine will continue to increase. There is a growing demand for vaccination among Federal employees in exposed occupations.

Evidence has been secured that second infections of Rocky Mountain spotted fever may occur. It is likely, however, that the gen-

erally accepted idea that infection confers immunity of long duration is justified in most cases.

Two important discoveries in connection with the investigations of typhus fever have been made during the year. The suggestion that some vector other than the body louse may be responsible for the transmission of endemic typhus of the United States has been made by a number of investigators, and during the year service officers discovered that fleas served as vectors of the disease. Further epidemiological and laboratory studies are being made on this subject.

A disease of the Rocky Mountain spotted fever type has been identified as occurring in States in the eastern and southeastern sections of the United States. During the course of field investigations of endemic typhus it became apparent that many of the cases observed differed materially in clinical aspects from endemic typhus as described by earlier investigators. It was noted that many of the cases suffered from a very severe disease which did not correspond to the clinical picture of endemic typhus and which resembled the spotted fever of the Rocky Mountains more closely than it did any other disease. Moreover, quite a high proportion of these cases gave a history of tick bite within a short time preceding onset. Laboratory studies confirmed the epidemiological findings. This eastern type of spotted fever has so far been found to exist in rural communities in Delaware, Pennsylvania, Maryland, the District of Columbia, Virginia, and North Carolina.

The study of the mental status of children of various types of birth includes the investigation of their family history, significant experiences, home environment, developmental history, medical history, personality traits, the behavior record, and school life, together with the obstetrical history of the mother. When these factors are correlated it is believed that some light may be shed upon the effect on the child of various obstetric procedures.

The need for further research in the mental hygiene of childhood has long been recognized, and a study of children of patients in State hospitals for the insane has been begun in an attempt to determine the effect, if any, upon them which may be attributed to association with psychotic adults.

Three additional studies of the health of workers exposed to dust have been completed. No excess in the sickness rate from respiratory or nonrespiratory disease was found when a group of street cleaners in the downtown area of a large city were compared with a similar group in a residential area where the dust content of the air was much less. Study of the effect of dust in a cotton-cloth-manufacturing plant showed no apparent relation between the dust and disease. Similar negative results were obtained in a study of dust exposure in a silverware-manufacturing plant. These results confirm those obtained in the first two dust studies (Portland cement and granite), to the effect that the relation of dust to health depends on the quantity and nature of the dust and on the duration of exposure.

The studies of the hazards in the radium-dial-painting industry have shown that there is evidence of the accumulation of radioactive material even under the improved conditions which have ob-

tained since 1926, although there is no indication that any individual employed since 1926 has been injured. It is believed, however, that a still further marked reduction of exposure to prevent accumulation and to provide a sufficient factor of safety under varying conditions should be made.

The possible hazard from methyl alcohol used as a substitute for denatured alcohol to prevent freezing in automobile radiators has been brought to the attention of the Public Health Service, and an agreement has been reached with the industry for the adoption of safeguards. In this agreement, reliance is placed on a distinctive coloring, a chemical deterrent, and a warning label.

The final report in the studies of physical development and posture has shown that the most marked characteristic of the data obtained was the wide variation in postural relations from person to person. No fixed types of posture could be found. Gradual variation of such magnitude as to defy classification into particular types was the rule.

There are now 437 cities located in 24 States which have adopted the standard milk ordinance for the improvement of milk supplies recommended by the Public Health Service. A number of research activities in connection with milk investigations were inaugurated. These studies include (1) means for heating the air and foam above the milk in pasteurization vats, (2) the determination of the most effective and practical devices and methods for the bactericidal treatment of utensils and equipment at dairy farm and pasteurization plants, (3) the public health importance of milk cooling, (4) the proper design of milk-sample shipping containers, (5) the public health value of chlorine disinfection of udders and hands in connection with the process of milking, and (6) laboratory methods for the estimation of milk quality from the public health point of view.

Records of illness during a 12-month period in a group of about 10,000 families scattered throughout the United States have been made available to the Public Health Service. These data are being tabulated, and it is expected that this study, which represents a very complete and detailed statement of the illnesses and medical care received by the family during the year, will be of great value in the field of epidemiology and public health.

The resurvey to determine the present sanitary condition of the Ohio River between Cincinnati, Ohio, and Louisville, Ky., has been completed. This resurvey has included the collection of 2,000 water samples, the chemical and bacteriological analyses at 10 main river points and from 4 of the larger tributaries between Cincinnati and Louisville, and the collection and tabulation of the necessary hydro-metric data and information relative to contributing population and sources of existing pollution. Preliminary analyses indicate that important changes have occurred in the river since the previous investigation in 1914-1916 and suggest rather definite conclusions as to the effect of canalization during the summer period.

Studies of the efficiency of artificial water purification processes have made it possible to prescribe definite limits in accepted bacteriological terms for sources of raw water from which purified water supplies in the Great Lakes and Mississippi River basins are derived. This is perhaps the most practical immediate result of the studies, though of scarcely secondary importance is the knowledge which

they have afforded of the fundamental characteristics and limitations of water purification processes in general.

The office of Studies of Public Health Methods was reorganized. Consultation service to local health officers has been continued, and, in addition, stress has been placed on scientific research in administrative practice. Plans have been developed for a special study to determine the public health needs of people living under rural conditions, how these needs are being satisfied, and the extent to which the small county health department is capable of meeting the demand now being imposed on it.

An appropriation of \$300,000 was authorized under the second deficiency act for the fiscal year 1931 to begin work on new buildings for the National Institute of Health, such buildings not to exceed a total of \$750,000. The necessity for these buildings is urgent to provide the required facilities for work now being conducted by the National Institute of Health.

Studies indicate that approximately one half of the cases of undulant fever reported are traceable to the use of raw milk from infected animals, and the other half are due to contact with infected animals on the farm, in stockyards, or in packing establishments. In a considerable number of the cases in which infection was probably received through contact with infected animals there is also a history of the use of raw milk. The prevention of milk-borne undulant fever can be accomplished by pasteurization of the milk, but the prevention of the contact-borne cases lies in the detection and elimination of *Brucella* infection from the livestock herds of the country.

The State of Delaware was added to the area of distribution for tularaemia, leaving only the four States of Maine, New Hampshire, Vermont, and Connecticut in which the infection has not been recognized. Studies on tularaemia at the field laboratory of the service located at Hamilton, Mont., have been directed toward determining susceptibility of various animals and the transmissibility of tularaemia by mosquitoes.

Studies of postvaccination encephalitis have resulted in a collection of data for 62 proved or probable cases for the past 10 years. Extensive attempts to produce the disease in laboratory animals by means of vaccine virus have uniformly failed to give the pathological picture of the disease.

Studies of the effect of hemolytic streptococci and their products on leucocytes has established that a toxic substance which disintegrates the leucocytes is produced by the action of hemolytic streptococci on red blood cells.

A new organism, designated *Alcaligenes faecalis*, subspecies *radicans*, was described. It was obtained by blood culture from a mild case of enteric disease which at first resembled typhoid fever.

The results of studies of the etiology of the epidemic of ginger paralysis showed it to be due to the consumption of ginger extract adulterated by the addition of triorthocresyl phosphate. Further studies have been made on the toxic action of other esters of phenolic compounds as compared with that produced by triorthocresyl phosphate.

Work on the chemotherapeutic action of arsenicals has been continued, particular attention being paid to the mechanism of the

action of arsenic on protoplasm. Research was completed on the relation of arsenic to the fixed sulphhydryl groups of proteins, with interesting findings with reference to the physiological and pharmacological function of proteins.

A number of new sugar compounds have been discovered in connection with the sugar researches. The studies of these new compounds, which are of importance in the field of sugar chemistry, which, in turn, is of importance in many problems of health and disease, may also help, as similar studies have in the past, to increase our knowledge concerning chemical constitution in organic chemistry in general.

The first meeting of the National Advisory Health Council was held on April 9 and 10, 1931, when the work of the Public Health Service was reviewed. Suggestions were offered for new lines of endeavor, but the council as a whole felt that the present work should be continued without material change.

THE MARINE HOSPITALS AND OTHER RELIEF STATIONS

In 157 ports of the United States and its possessions hospital care, out-patient treatment, and other medical services were furnished to American merchant seamen and other legal beneficiaries. Although 90 per cent of the hospital treatment is furnished in the marine hospitals, contracts are maintained with 196 public and private hospitals in the smaller and remote ports. Merchant seamen continued to be the most important class of beneficiaries, receiving 3.3 per cent more hospital treatment and 14 per cent more out-patient relief than in the preceding year. In addition to the treatment provided at the marine hospitals and other regular relief stations for the Coast Guard, which now has a personnel of more than 13,000 men, 22 medical and dental officers were detailed for duty on vessels and elsewhere and 108 part-time local physicians served isolated Coast Guard units. The usual assistance was given to the Civil Service Commission, the Steamboat Inspection Service, Employees' Compensation Commission, Veterans' Administration, and other Government establishments.

The medical services furnished for the Employees' Compensation Commission would, it is estimated, have cost the compensation fund more than \$1,000,000 if obtained from private sources. A daily average of 842 patients of the Veterans' Administration were treated in marine hospitals in ports where the use of these institutions has made the construction of special hospitals unnecessary. Cooperation with the Veterans' Administration has been close and cordial.

For all classes of beneficiaries an aggregate of 1,666,215 hospital-patient days and 910,466 out-patient treatments were furnished and 94,487 physical examinations made for purposes other than medical treatment. The number of leper patients at the National Leper Home increased from 308 to 337 during the year.

Satisfactory progress has been made with the building program. Construction of the new marine hospitals at Galveston, San Francisco, and New Orleans has been nearly completed and work has commenced on the Seattle institution. The contract has been let for the addition at Key West. Architects are engaged in the preparation of plans for the new marine hospital buildings at Stapleton, New

York, Baltimore, Norfolk, Louisville, Chicago, Evansville, Detroit, Memphis, and Mobile. The building program not yet provided for includes additional or improved hospital facilities for the National Leper Home and the marine hospitals in Boston, Buffalo, Pittsburgh, St. Louis, Portland (Me.), and Fort Stanton (N. Mex.).

PREVENTION AND CONTROL OF VENEREAL DISEASES

During the fiscal year ended June 30, 1931, the State health officers of 43 States reported to the Public Health Service 227,470 cases of syphilis, 154,809 cases of gonorrhoea, and 3,987 cases of chancroid. These diseases as a class continue to exceed the number of cases reported during the calendar year of any other single communicable disease, with the exception of measles. The research activities have been continued along the lines followed in the preceding year. Special studies of the carrier problem of syphilis were inaugurated in the research laboratory of the marine hospital at Stapleton, N. Y., from the standpoint of determining the duration of infectivity in treated and untreated syphilitics. The search for an efficient prophylactic method was continued during the year with inconclusive results.

Increasing importance is attached by syphilographers to the early diagnosis and treatment of syphilis. The possibility of extending to rural and remote districts the advantages to be derived from early diagnosis by means of microscopic examination was studied, and one method was worked out. This method has been tested by other observers and at present is in operation by the health department of one State and is under consideration by others.

Valuable research on the use of biologic products in the diagnosis and treatment of gonorrhoea was continued during the year to include fractioning the gonotoxin, which should lead to some definite knowledge with regard to the therapeutic values of the separate fractions.

The malaria treatment of general paralysis of the insane is now generally considered the most effective treatment of this condition. As a result the Public Health Service receives each year an increasing number of requests for infected material for inoculation purposes. Plans are under way to supply this need and to make further studies of this method of treatment in cooperation with various institutions where it is being applied.

The special study of syphilis among negroes in rural areas, in cooperation with State and local health authorities, inaugurated in 1929 with the financial assistance of the Julius Rosenwald Foundation, was expanded to include areas in five other States. A total of 28,195 negroes were serologically tested, and of this number 5,785, or 20.5 per cent, were found syphilitic on the primary survey. Of these positive cases approximately 75 per cent were placed on intravenous medication, and at the close of the year 45 per cent of them had received treatment in amount considered sufficient to render them noninfectious.

An important feature of the year's work has been the expanding cooperation in the service and with other Federal and nonofficial agencies. Notably has this been the case between the Venereal Disease Division and (a) the Hospital Division in the preparation

of standardized case record forms, and (b) the Division of Mental Hygiene in the establishment of standards for treatment of venereal diseases among inmates of Federal penal and correctional institutions, with the Department of Justice (Board of Parole) in the preparation of a plan for additional treatment for discharged or paroled prisoners, and with the Office of Indian Affairs in the mass control of syphilis among reservation Indians.

A 1-day census of the cases of venereal disease taken in three cities shows marked variation in the relative incidence and prevalence of these diseases as observed in different localities. A resurvey of one entire State and of a number of communities, originally studied in 1927, made in order to determine the trend of venereal diseases and the effect of the methods employed for their control during the 3-year period, disclosed the significant point that in communities where increases in the prevalence rates were found they occurred in the group of chronic cases, an indication that patients are being treated for a longer time than formerly.

NARCOTIC FARMS AND MEDICAL AND PSYCHIATRIC CARE OF FEDERAL PRISONERS

The year ended June 30, 1931, marks the first full 12 months' activities of the Division of Mental Hygiene. The functions of this division, as defined by law, are both administrative and investigative in character.

During the year studies have been continued of the nature of drug addiction and the best methods of treatment and rehabilitation of persons addicted to the use of habit-forming drugs; information has been disseminated on researches in this particular field; State and local jurisdictions have been cooperating with the view to their providing facilities for the care and treatment of narcotic drug addicts, while other agencies, both governmental and voluntary, have cooperated with a view to better coordination of effort in these particular functions.

Studies have been conducted dealing with the subject of the abusive use of narcotic drugs and the quantities of such drugs necessary to supply the normal and emergency medicinal and scientific requirements of the United States.

The site for the first narcotic farm, near Lexington, Ky., was acquired during the year and plans were begun for the development of the necessary buildings to accommodate 1,000 inmates. A site for the second narcotic farm, near Fort Worth, Tex., was selected by the three Cabinet officers charged in law with this responsibility.

A significant change affecting the individual Federal prisoner occurred during the fiscal year ended June 30, 1931. Under the act approved May 13, 1930, the service inaugurated a system for supervising and furnishing medical and psychiatric services for Federal prisons. This new function involved the employment of additional medical and technical personnel. After preparing regulations governing the relationship to be maintained between the two departments concerned, the work was inaugurated at the United States penitentiary, Atlanta, Ga., and the Federal Industrial Institution for Women, Alderson, W. Va., on September 1, 1930; the United States penitentiary, Leavenworth, Kans., on October 1, 1930; the

United States Industrial Reformatory, Chillicothe, Ohio, on February 1, 1931; the Federal Prison Camp No. 2, Petersburg, Va., on April 1, 1931; and the United States penitentiary, McNeil Island, Wash., on June 15, 1931. The medical work at the United States penitentiary annex, Fort Leavenworth, Kans., was furnished by the service in connection with the special studies of the nature of drug addiction conducted among the drug-addict Federal prisoners segregated and confined in that institution.

Thus far, in the conduct of this important adjunct to the rehabilitation of Federal prisoners, the service has been concerned almost wholly with the administrative problems involved. Future investigations and research studies have been planned, however, using the clinical material available in these institutions.

COOPERATION WITH OTHER AGENCIES

During the past fiscal year the Public Health Service continued its extensive cooperation with other public health agencies—international, Federal, State, and local—and with private and voluntary organizations. In certain instances these cooperative activities are required by law, while in other cases they are considered essential for proper public health administration. Among the most important of such activities may be mentioned the following:

1. With the Department of State in the treatment of sick, destitute seamen returned from abroad; in detailing commissioned medical officers for duty at consulates in Europe, the British Isles, Canada, Mexico, and Cuba to examine intending immigrants for visa purposes, for the issuance of bills of health by American consuls, and related quarantine work; in the assignment of a medical officer as one of the delegates on the part of the United States to the Conference on the Limitation of the Manufacture of Narcotic Drugs, held in Geneva, Switzerland; in a preliminary investigation of the health hazards connected with the smelter fumes at Trail, British Columbia.

2. With other bureaus of the Treasury Department in hospital care and medical and hospital services to the Coast Guard, including retired personnel; by the assignment of medical and dental officers for duty at shore stations and on vessels of the Coast Guard; by assignment of dental officers to the Coast Guard cutter *Northland*, making a cruise to Alaska; in the development of venereal disease control activities among Coast Guard personnel; in making sanitary surveys of Coast Guard stations; in furnishing permits to ships for medicinal liquor and narcotics; service of Public Health Service officers on committees for the examination and disposition of narcotic drugs; with the Office of the Supervising Architect in the preparation of plans for the erection of the first narcotic farm near Lexington, Ky.; and plans for water-supply and sewage-disposal systems at border stations.

3. With the War and Navy Departments in physical examination of applicants for Officers' Reserve Corps and citizens' military training camps; medical and hospital services for civilians employed on vessels of the Mississippi River Commission, Army Engineer Corps, and Army transports; treatment of officers and enlisted men of the armed forces (as pay patients); advising the Philadelphia Navy Yard regarding their mosquito-control problems.

4. With the Department of Justice in assigning a number of officers to furnish the medical and psychiatric services in Federal penal and correctional institutions; making sanitary surveys of water-supply and sewerage systems and milk supplies at penal institutions; in the standardization of the treatment of the venereal diseases in Federal penal and correctional institutions; in advising with officials of the Bureau of Prisons relative to the location and plans for the Hospital for Defective Delinquents authorized by the act of May 13, 1930; assisting in medical problems incident to the use of contract jails and prisons; with the Prohibition Bureau in the preparation of reports on the etiology of the epidemic of ginger paralysis.

5. With the Post Office Department in supplying first aid and special physical examinations; inoculation, against typhoid fever, of employees handling mails, and vaccination against smallpox; medical testimony in the suppression of frauds.

6. With the Department of the Interior, Office of Indian Affairs, in a study of dental caries due to dietary deficiencies among the Indians; in the investigation of water-supply and sewerage systems on Indian jurisdictions; in the development and organization of mass control of syphilis among reservation Indians; in continuing the assignment of medical officers to supervise medical work among the Indians; the National Park Service in maintaining the joint venereal disease clinic for indigents at Hot Springs, Ark.; and in the sanitary supervision of national parks and monuments.

7. With the Department of Agriculture by the inoculation of certain field employees against typhoid fever and vaccination against smallpox; by assisting in the local enforcement of plant and animal quarantine; with the Bureau of Animal Industry in cooperative milk studies to determine the relative merits of goat, Holstein, and Jersey milks as a food for infants; with the Food and Drug Administration in the enforcement of the pure food law in relation to the adulteration of shellfish and by expert testimony; with the Forest Service in making sanitary surveys of national forests and watersheds.

8. With the Department of Commerce in the matter of standardizing and administering procedures required of aircraft arriving in the United States from foreign countries, and the development of marine standards, in cooperation with the American Marine Standards Committee, relating to ship sanitation; with the Bureau of Standards by the detail of a medical officer to give medical relief and study industrial hazards; with the Bureau of the Census by the collection of statistical data on crime, and on the defective, dependent, and delinquent classes; with the Bureau of Mines in continuing a medical officer on duty as chief medical officer, supervising the activities of a number of civil-service physicians furnished by the Public Health Service, but whose salaries are paid by the Bureau of Mines; with the Steamboat Inspection Service in giving physical examinations and instruction and examination in the principles of first aid of applicants for license as ships' officers; treatment of lighthouse keepers and seamen from vessels of the Lighthouse Establishment, Coast and Geodetic Survey, and Bureau of Fisheries; furnishing medical supplies to lighthouse vessels; making sanitary surveys of lighthouse stations and examination of drinking-water systems on vessels; with the Bureau of Fisheries in a survey of malaria conditions at the United States fisheries station, Orangeburg, S. C.

9. With the Department of Labor by examining immigrants in the United States and abroad and treating detained aliens, and standardizing and administering procedures required of aircraft arriving in the United States from foreign countries.

10. With the Civil Service Commission by physical examination of applicants and employees, and for reinstatement and retirement.

11. With the United States Shipping Board in the physical examination of crews and in the development of a program for prevention of venereal diseases among seamen in the American merchant marine.

12. With the United States Employees' Compensation Commission by furnishing hospital and out-patient treatment of disabled Federal employees; by physical examinations and special investigations; by providing a permanent board of medical officers for disputed and difficult claims; by medical assistance in carrying out the longshoremen's and harbor workers' compensation act and the District of Columbia workmen's compensation act.

13. With the United States Veterans' Administration in physical examinations and hospital and out-patient treatment of patients; in furnishing advice to the engineers on water-supply and sewerage systems at the veterans' hospital at Northport, N. Y.; with the Bureau of Pensions in physical examinations of applicants for civil-service retirement and for military pensions requested by that bureau.

14. With the Committee on Claims, House of Representatives, in giving physical examinations of subjects of special bills.

15. With the Office of Chief Coordinator by detailing medical officers for service on committees of the Federal Specifications Board and on the Federal Standard Stock Catalogue Board.

16. With the Office of Public Buildings and Public Parks of the National Capital in the sanitary inspection of Government office buildings in Washing-

ton, and in mosquito control work on Government reservations in the District of Columbia.

17. With the Federal detention headquarters in New York City in a study of ventilating conditions at the headquarters.

18. With the Federal Trade Commission in rendering expert medical opinions in determining justification for claims.

19. With the Health Department of the Panama Canal by the detail of an officer to conduct special studies in malaria and of the bionomics of *Anopheles*.

20. With the Office International d'Hygiene Publique, Paris, and the Pan American Sanitary Bureau, Washington, D. C., in matters relating to maritime quarantine, and the exchange of information relative to the prevalence of quarantinable diseases. Officers have been detailed to the Pan American Sanitary Bureau, and through that bureau have extended aid to various countries in South America with relation to the suppression of quarantinable diseases.

21. With the health section of the League of Nations in the collection of data requested from this country to be used in a world-wide clinical study of syphilis, and in supplying information as to the prevalence of diseases in the United States.

22. With all States of the Union in the collection of morbidity reports and epidemiological data relating to communicable diseases.

23. With all States in the supervision and certification of water supplies used by common carriers in interstate traffic.

24. With State departments of health in securing reports of cases of venereal diseases and compiling and publishing reports of State control and clinic activities.

25. With the State departments of health in segregating lepers at the National Leper Home, Carville, La.

26. With the New York State Department of Health in the development of educational work on the prevention of venereal diseases.

27. With Mississippi, Alabama, Georgia, Tennessee, North Carolina, and Virginia in the development of State venereal disease control activities.

28. With the States of Alabama, Arizona, Arkansas, California, Florida, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Mississippi, Missouri, Montana, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, and West Virginia in making cooperative demonstrations in county health work in counties in these States.

29. With Arkansas, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Montana, Oklahoma, Pennsylvania, Tennessee, Texas, Virginia, and West Virginia in cooperative county health work in the drought-stricken areas.

30. With Alabama, Connecticut, Delaware, Florida, Georgia, Louisiana, Maine, Maryland, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Texas, Virginia, and Washington in the investigation of shellfish-growing areas and the development of local sanitary control machinery.

31. With Kentucky, Missouri, Tennessee, Georgia, Illinois, Oklahoma, and Texas in measures for the prevention and eradication of trachoma, and with Kentucky, Missouri, and Tennessee in maintaining hospitals for trachoma.

32. With Utah, Indiana, and Massachusetts in making surveys and furnishing advice concerning mosquito-control measures.

33. With Colorado and Oklahoma in studies of public health administration.

34. With South Carolina in furnishing biological products used in the prevention of epidemic diseases.

35. With New York in an investigation of cases of psittacosis.

36. With Maryland in regard to a problem in connection with the effluent of sewage treatment plant discharges.

37. With Delaware in the investigation of a suspected case of typhus.

38. With Louisiana in advice regarding the sanitary condition of drainage channels in the vicinity of New Orleans.

39. With Tennessee in a survey of industries in Kingsport, with particular reference to tuberculosis.

40. With Texas in developing a malaria control program, including a county-wide screening project.

41. With Alabama by supplying a lecturer at the sanitary inspectors' school.

42. With New Jersey in the diagnosis of a case of spotted fever.

43. With Oklahoma by the detail of an officer to outline a malaria control program in that State.

44. With Iowa in a study of their lake and stream pollution problems.

45. With Louisiana by detail of an officer to assist in planning an investigation of the pollution of Bayou Bienvenue.

46. With Utah in connection with their mosquito control problem.

47. With California in an investigation of the outbreak of multiple neuritis resulting from drinking Jamaica-ginger extract, and in problems regarding the functioning of the State narcotic farm.

48. With Wisconsin in advice concerning the sewage-disposal and water-filtration problems of the city of Milwaukee.

49. With Georgia by the detail of an officer to study the prevalence of endemic typhus fever in that State.

50. With Missouri by investigation of a suspected outbreak of smallpox.

51. With Georgia and Tennessee by county-wide dusting studies for the control of *Anopheles* mosquitoes.

52. With the State and city health departments of Wilkes-Barre, Pa., and Baltimore, Md., in a survey of the public health administration of their city health departments.

53. With the cities of Baltimore (Md.), Charleston (W. Va.), and New Orleans (La.), and the States of Illinois, Arkansas, West Virginia, Kentucky, and Oregon in venereal disease prevalence surveys.

54. With 17 States by the distribution of Rocky Mountain spotted fever vaccine.

55. With the District of Columbia in mosquito control work in the District and in a study of causes for the disintegration of a concrete sewer.

56. With San Francisco, Calif., and with the cities and counties in the vicinity of San Francisco Bay in rodent control and the operation of the plague laboratory at San Francisco.

57. With Knoxville, Tenn., and El Paso, Tex., in making studies of public health administration.

58. With the Canadian Health Department in the enforcement of Canadian and American regulations concerning water supplies used by foreign vessels operating on the Great Lakes and in shellfish sanitation work.

Cooperation has also been carried on with a number of organizations engaged in public health activities, namely, the infantile paralysis commission of Harvard University in studying the effect of artificial fever upon the development of the virus of poliomyelitis; the Julius Rosenwald Fund in the promotion of syphilis control demonstrations among rural negroes in the Southern States; the Milbank Memorial Fund in research in syphilis and in studies of physical impairments and occupation; the National Safety Council by officers serving on several committees; the Gorgas Memorial Laboratory in special studies of malaria; the drug committee of the National Research Council; the statistical committee of the American Psychiatric Association; the psychiatric committee of the American Medical Association; with the Bureau of Social Hygiene, New York City, in matters relating to mental hygiene; the governor's commission for the State of Massachusetts appointed to study and survey the narcotic drug situation in that State; with the Narcotic Education Association of the Community Chest Fund of Detroit, Mich., relative to the treatment, care, and after care of drug habitués of that community, with special reference to the functioning of a local "narcotic farm"; with the American Hospital Association concerning the best method of restricting to indispensable purposes the use of narcotic drugs in American hospitals; with the American Social Hygiene Association in the conduct of venereal disease prevalence surveys and the publication and distribution of scientific literature on the management of syphilis and gonorrhoea and the prevalence of these diseases; with various committees of the White House Conference on Child Health and Protection in preparation of committee reports; with the Committee on the Costs of Medical Care in a study of the incidence and cost of illness; with the World Association for Adult Education by Radio Committee in making a survey of State and local health departments to determine the extent of the use of radio in the United States for health education; the National Research Council by representation on the Committee on Drug Addiction; the revision committee of the United States Pharmacopoeia in the development of certain standards; the Missouri Pacific Railroad in a survey of malaria conditions along the southern portion of this railroad; the American Railway Association in the formulation of regulations concerning the sanitation of railway water supplies and coach-yard sanitation;

American Standards Association in assisting in the formulation of standard specifications for household refrigerators; the Federation of Sewage Works Association in formulating plans of research work in sewage-disposal problems; with the Rockefeller Foundation in cooperative county health work and emergency health work resulting from the drought; with the department of chemistry, College of Hawaii, in investigations of a preparation reported to be a water-soluble derivative of chaulmoogric acid; with the Girl Scouts of the District of Columbia and the Neighborhood House in making physical examinations; the American Social Hygiene Association in the conduct of venereal disease prevalence surveys and the publication and distribution of scientific literature on the management of syphilis and gonorrhea and the prevalence of these diseases; with the reorganized committee on clinical research in syphilis, comprising the directors of the syphilis clinics of Johns Hopkins University, Mayo Clinic, University of Michigan, University of Pennsylvania, and Western Reserve University; and with the Marine Library Association in the distribution of educational material to seamen in the merchant marine.

By means of the cooperation maintained between the several divisions of the bureau, advantage is taken of facilities, including hospital and laboratory, for the efficient execution of the special work of a particular division.

During the year cooperative assistance has been received from a number of unofficial organizations and laboratories. Laboratory facilities and other valuable assistance have been furnished in connection with service investigations of cancer, leprosy, syphilis, mental hygiene, and trachoma; Harvard Medical School, University of Hawaii, University of Kentucky, the Columbia (S. C.) State Hospital for the Insane, Missouri School of Mines, and the Johns Hopkins University for office space and records in the study of mental health of the child of various types of birth. In addition, the Public Health Service desires to acknowledge assistance received from the following agencies: Florida State Board of Health, Indiana State Board of Health, Washington State Board of Health, the city health departments of Baltimore, Buffalo, and Milwaukee, and the University of Kentucky for Wassermann tests performed; the Department of Health of Porto Rico for the use of its laboratories; the New York State Institute for the Study of Malignant Diseases for the care and study of cases of suspected cancer. The cooperation rendered by these several agencies is hereby acknowledged. Through this means the conduct of important activities has been made practicable. This mutual relationship on the part of official and unofficial agencies is to be encouraged in the interest of the public health.

PERSONNEL

Shortly after the beginning of the fiscal year all of the personnel changes made immediately necessary by the passage of the act approved April 9, 1930, had been made. It is apparent that the enactment of this legislation already has done much toward further elevating the morale of the commissioned personnel.

RECOMMENDATIONS

The development and administration of research in public health may be likened to the mining and recovery of a valuable metal. The mining operations which require scientific knowledge, skill, and patience, and necessitate constant exploration into unfamiliar ground, correspond to the important and necessary research that must be conducted in the public health laboratory, in the field, and in the realm of public health administration. For considerable periods these efforts may seem unprofitable, useless, and quite expensive, just as costly exploration by shafts and drifts, the thinning of a vein, and the necessity for handling low-grade ore often make the wisdom of mining operations seem questionable. From time to time, however, public health research results in important discov-

eries, emphasizing the necessity for constantly searching out and testing new deposits of knowledge that await the patient investigator.

Following the discoveries, a little more than half a century ago, of the bacterial cause of many diseases, additional important scientific discoveries were relatively easy, just as gold nuggets may be picked up and "bonanza" ore deposits found in a rich area in the region of the mother lode. As exploration progresses, the making of discoveries becomes more difficult; as the field is more thoroughly worked there follows a period of more routine activity, and the important finds are less frequent; but exploration into what for a time may seem an unpromising field oftentimes yields results that are most useful.

And, as with mining operations, investigative work into the cause and prevention of disease is not without danger; several workers of the United States Public Health Service have lost their lives in line of duty in connection with studies of various diseases. The Public Health Service has been the pioneer in opening up a number of new fields of scientific inquiry relating to the cause, the mode of spread, and the prevention of disease. In continuing the analogy it might be pointed out that scientific studies and laboratory investigations which contain new data or any new facts must be carefully worked over and these new facts must be assembled and interpreted, just as an ore must be treated and refined.

However valuable ore or metal may be, it is of no benefit to mankind until it is actually utilized. This principle applies as well to scientific discoveries, which, although important and of value, must be put into actual use by public health officers in order that the benefits to be derived from these discoveries may be obtained.

With the progress of public health during the past half century there has been much improvement in conditions of general environment, such as water supplies, milk, food, housing conditions, and related matters having to do with the environment of the general population. Although there is still need for constant vigilance in these matters, there is not at the present time so urgent a need for correction of general environmental conditions. However, with the continued increase of the population in many sections, there are still many important problems relating to sewage disposal and water supplies which must be considered. With the improvement of general environmental conditions, there is need for more emphasis upon the environment of the individual as relates to occupation, personal health, and similar matters. One of the important needs of the present day in public health is the development of facilities for the application of known facts relating to the prevention of disease. This means a strengthening and development of health service as rendered by local, State, and Federal health officials. Important scientific discoveries may be made; but unless such discoveries are applied to the prevention of disease, little benefit results. The following recommendations regarding the more important needs are submitted:

SCIENTIFIC RESEARCH

An appropriation of \$300,000 for beginning construction of an additional building at the National Institute of Health was secured in the second deficiency act for the fiscal year 1931. Careful study has been given to the arrangement and character of the building to

be constructed so that it may best fit in with the growing needs of the National Institute of Health. This building should be completed as soon as possible in order properly to house work now being carried on by the institute.

The act of February 27, 1931 (Walsh), authorized the purchase of the laboratory of the State Board of Entomology of Montana and the construction of a new building. The second deficiency act for 1931 appropriated the funds for this purpose. This construction is urgently needed, not only to provide facilities for the manufacture of an increased amount of vaccine for the prevention of Rocky Mountain spotted fever, which is being demanded of the Public Health Service, but also to accommodate the increased personnel engaged upon this work.

Plans have been begun for the construction of a laboratory unit at the marine hospital at San Francisco which will be devoted to scientific studies. This construction will form the fourth unit for laboratory research. These units are the National Institute of Health, Washington, D. C.; the stream pollution investigations laboratory at Cincinnati, Ohio; the Rocky Mountain spotted fever laboratory at Hamilton, Mont.; and the San Francisco laboratory. This chain of laboratories should be developed as rapidly as possible to allow facilities for the progress of scientific investigations and, of more importance, for the training of officers and scientific personnel.

RURAL HEALTH WORK

It is believed that rendering assistance to State and local authorities by the Public Health Service in the development and extension of adequate rural health service constitutes one of the most important activities of the Federal Government. The best way to prevent the interstate spread of disease is to prevent the occurrence of transmissible illness at the source; sanitarians generally now concede that attempts to prevent the spread of highly contagious infections through the application of local quarantine measures are effective only to a very limited degree. The control of communicable diseases has become largely a matter of community-wide activity, in which environmental sanitation, general immunization, and intensive educational work play the most important part. The number of counties in the United States as yet provided with reasonably adequate health service is comparatively very small, and it is difficult to convince local authorities in many communities of the necessity for such service until tangible results of the work have been demonstrated. To the end that extension of rural health service may go forward more rapidly, it is considered most important that the Public Health Service be enabled to continue this demonstration work.

LEGISLATION

There should be legislative authority for paying the expenses of the return to their former homes, or such other places designated by their next of kin, of the dependents and personal effects of officers who die in line of duty. At the present time, in the event of an officer's death, only the expense of preparation and shipment of his body to his home is authorized. The cost of bringing home his

dependents and personal belongings must necessarily be borne from private funds. It is felt that this is a financial obligation which should be assumed by the service which has ordered him away from his home in the discharge of its official functions.

Since the only allowance now made to commissioned personnel assigned to temporary duty away from official station is mileage at the rate of 8 cents per mile, subsistence, as well as transportation, must be paid from this allowance. Should the assignment extend over a considerable period of time, as the exigencies of the service often require, and the temporary station is so far removed as to preclude the daily return to the permanent station, the officer must subsist himself from personal funds at his temporary duty station. It would appear that the only source of relief to commissioned personnel from this financial burden would be through legislation, and it is urgently recommended that such legislation be sought.

MARITIME QUARANTINE

The probability of the importation of disease via airplanes is becoming more and more a problem of international interest. Regular lines of aircraft have been established, providing direct and rapid communication between areas in Africa, Asia, and South America which have long been endemic centers of various pestilential diseases. The journey by airplane from most of the endemic centers of these diseases is usually less than their incubation period. An example of this is shown in the recent reported occurrence of probable cases of yellow fever in the interior of Colombia, in the region of Santa Marta and Barranquilla. Quarantine officers are required to be ever on the alert to detect cases of these diseases. In order to carry out existing provisions of quarantine and immigration laws relating to the medical examination of persons from foreign countries, all airplanes from foreign countries should be required to undergo quarantine and medical immigration inspections upon arrival at designated airports of entry; and it is recommended that the designation of airports as airports of entry should be limited in number and confined to the principal airports possessing adequate facilities along the frontiers, at many of which locations personnel are already available. The designation of numerous airports as airports of entry, particularly those in interior locations without adequate facilities for the conduct of quarantine and immigration functions, practically prevents the proper and necessary medical inspection of planes and their passengers, inasmuch as medical personnel are not available for this work.

Properly to maintain the boarding and fumigating vessels required at the various quarantine stations, some 60 in number, a continuous replacement program is necessary. These vessels are engaged in arduous duty, which requires special design for boarding and fumigation work in exposed locations, as well as especially rugged construction. The continuation of the minimum-replacement program of two vessels per year, based upon a useful life of 30 years, is required to maintain this essential floating equipment, a large portion of which is attaining advanced age and an additional portion of which was of war-time construction, subsequently transferred to the Public Health Service without cost.

In recognition of the performance of foreign quarantine operations as a Federal function, several States relinquished their performance to the Federal Government with the understanding that facilities adequate to the needs of such work would be maintained and supplied by it. In some instances adequate facilities are not available, and in order properly to perform quarantine duties for the protection of ports in these States in particular, and the country in general, against the possible introduction of exotic and pestilential diseases from infected places abroad, it is recommended that facilities adequate to the needs of such ports be provided.

PRINTING

There is an increasing need for more adequate appropriations for printing. The establishment of the Division of Mental Hygiene, with the natural increase of its work in connection with the development of the narcotic farms, the furnishing of medical service in Federal penal and correctional institutions, and the studies of the amount of opium that may be allowed to be imported to meet the normal and emergency needs of the United States, have all served to increase the printing needs of the service. There has also been an increasing demand from State and local health authorities for publications relating to the various phases of public health. The number of requests from individuals for publications continues to increase.

PREVALENCE OF DISEASE

Many requests have reached the Public Health Service for authoritative information as to the effect of the present economic situation upon the public health. Such information as was available was furnished. Some of this information was rather meager. It would have been most desirable to have been able to supply more complete and comprehensive information upon this subject. It will be recalled that recommendations have been made for several years past that a small appropriation be made for the purpose of developing and stimulating better reporting of the notifiable diseases. Had such appropriation been available, the data furnished in response to the inquiries received would have been much more satisfactory and useful.

PERSONNEL

The widening scope of service activities and the increasing obligations imposed upon it, calling for additional specialized personnel, as illustrated by the accomplishments heretofore mentioned, and the future obligations involved call attention once more to the pressing need for enlarging the number of regular medical officers so as to permit and provide specialization in certain lines of its essential work.

More regular medical and dental officers are needed for assignment to the marine hospitals and Federal penal and correctional institutions, where the best service is provided by career men with singleness of purpose, belonging to a mobile corps. Additional medical officers are needed to make additional physical examinations

for the Civil Service Commission, for which the present force is inadequate, and to comply with requests from the Department of Commerce and Department of Agriculture for medical supervision of large groups of Government employees.

The sanitary engineering work conducted by the service for other departments and bureaus of the Federal Government has rapidly increased to such an extent that the present number of engineer officers does not enable the service to meet the demands for such assistance and at the same time discharge properly its duties prescribed by regulations and law in relation to preventing the interstate spread of disease. If additional work be undertaken for other governmental agencies, additional sanitary engineer officers will be needed.

H. S. CUMMING,
Surgeon General.

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

DIVISION OF SCIENTIFIC RESEARCH

In charge of Asst. Surg. Gen. L. R. THOMPSON

CANCER

Surg. J. W. Schereschewsky has continued in charge of the office of field investigations of cancer, with headquarters at the Harvard Medical School, Boston, Mass.

During the past fiscal year a considerable increase in the appropriation available for cancer investigations has permitted a corresponding expansion of the scope of the work. A biologist, a biochemist, and additional laboratory attendants were added to the staff during the year, so that by the end of June, 1931, there were 12 persons engaged in the work at this station. Considerable time and effort were also expended during the year in expanding the facilities and in planning for and procuring the additional equipment required for the work.

The cancer research work has been organized and is being developed along the following lines:

- (1) Studies of the biological effects of radiation.
- (2) Studies of resistance and immunity to malignant growths.
- (3) Studies of the biochemistry of malignant cells.
- (4) Studies of susceptibility to malignant growths and its modification.

Studies of the biological effects of radiation.—The projected scope of these studies includes the investigation of the biological action of the whole spectrum of radiation, from the highest-frequency X rays to electromagnetic radiation.

The following progress along these lines has been made during the fiscal year:

Apparatus is being assembled and preparations are being made to undertake a study of the biological action of X rays. The important physical factors to be determined are the wave length of the radiation, the total energy of the beam, and the amount of energy absorbed by the cells. Although much work has been done to investigate the action of the X rays upon living cells with respect to the wave length of the radiation, the results so far obtained can not give more than a rough idea of such process, because the physical factors involved have been determined only in approximate fashion.

The plan of study now being developed at this station contemplates the use of methods much more precise than those which have hitherto been employed, as shown by the following outline.

An X-ray generator has been designed and delivered which permits the variation of wave lengths within wide limits (from wave lengths corresponding to 10 to those corresponding to 350 kilovolts) and which furnishes radiation of sufficient energy for this

type of experiment at the various wave lengths within its range. By means of a specially-constructed X-ray spectrograph of the Compton type, provided with a special collimating device, radiation from the X-ray generator may be analyzed so as to deliver beams of homogenous X rays which at each frequency will have an intensity sufficient to show a biological action on certain types of living cells.

It is proposed to begin with *Drosophila* eggs as the biological material, as these have been shown to be very sensitive to radiation, and, in addition, as has been shown by numerous investigations, their reaction to radiation can be measured with a considerable degree of accuracy. Other experiments are planned with bacteria, embryonic tissues, malignant cells, and the like.

While it is possible to measure the absolute energy of the beam, satisfactory information may also be obtained by measuring relative intensities. This may be done by the use of an ionization chamber of special construction filled with the rare gases, xenon and krypton, which have a high absorbing power for X rays. It will likewise be necessary, in this connection, to measure the absorbing power of the biological material in order to determine the amount of energy which this absorbs.

It is hoped that this line of investigation will yield the following information:

- (1) The dependence, under exact physical conditions, of the biological reaction upon the penetrating power of the radiation.
- (2) The dependence of the reaction upon the energy density.
- (3) The "mortality curve" for different energies at a given wave length.
- (4) The relative and perhaps an estimate of the absolute energy necessary to destroy a cell.

Mitogenetic radiation.—In 1925 Alexander Gurwitsch published the exceedingly interesting observation that dividing cells emit a radiation of a frequency in the ultra-violet of somewhere in the neighborhood of 2,000 to 2,400 Ångstrom units. This radiation emitted by the dividing cell has, according to Gurwitsch, the property of stimulating the process of cell division in neighboring cells.

Since the publication of Gurwitsch's original paper much work in extending his original observation has been done by him and his co-workers, and his results have apparently been confirmed by competent European investigators. So far, in the United States, this work appears to have attracted but little attention, as only one paper (confirmatory of Gurwitsch's results) has appeared in an American journal.

Since malignant cells are said to emit this so-called mitogenetic radiation, it would appear that the study of this phenomenon is of importance, not only from fundamental biological considerations but also as tending to throw light upon one of the problems in relation to cancer, namely, the mechanism by which malignant cells induce the body to furnish them with a supporting stroma and with a blood supply. Work has therefore been begun during the past fiscal year in order to determine the actuality of mitogenetic radiation, and further, if found to be present, to study its physical properties.

In this connection Biophysicist Lorenz has constructed and has been engaged in perfecting a very sensitive apparatus for detecting and measuring extremely small quantities of radiation—the so-called

Geiger counter tube. The apparatus consists essentially of a photo-electric cell which, by special choice of materials, may be made extremely sensitive to radiation in the ultra-violet portion of the spectrum. Electrical impulses caused by the entrance of radiation through the quartz window of the cell may be amplified in an amplifier of special design so that they may be made audible by the use of a loud-speaker, or may operate a counting device which records numerically the impulses resulting from the incident radiation.

This instrument is now being employed in the study of mitogenetic radiation in the following ways:

(1) Its use will permit the direct determination of the presence or absence of the so-called mitogenetic radiation.

(2) By developing modifications of the instrument which are sensitive only to certain regions of the spectrum, especially the long and the short ultra-violet regions, some general information will be obtained as to the region of the spectrum (now in dispute) to which mitogenetic radiation belongs.

As the result of preliminary runs with the apparatus, certain sources of error were found, and it also appeared as though the general sensitivity of the apparatus could be improved. Consequently during the last quarter of the fiscal year considerable developmental work was done with respect to this type of photo-electric cell. As a result of these studies, optimum sensitivity of the cell has been secured, so that it will be possible to make runs under test conditions in the near future.

Biological studies of mitogenetic radiation.—In addition to the physical methods, the presence of mitogenetic radiation was investigated in a preliminary way by biological methods.

According to the published observations of Gurwitsch, Reiter and Gabor, and others, onion rootlets are stated to be very sensitive indicators of mitogenetic radiation. These, together with yeast cells, have been used as indicators in a series of experiments by which it is hoped to determine whether or not radiation is actually present. So far these experiments have been inconclusive, but they will be continued until this question has been satisfactorily answered.

Studies of electromagnetic radiation.—Steps are being taken to construct a new oscillating circuit employing the "magnetron" tube recently developed by the General Electric Co. by means of which frequencies of the order of 400,000,000 cycles per second with considerable energy output may be obtained. When this circuit has been set up and tested, further observations of the biological action of these frequencies will be made.

Toward the end of the fiscal year this station cooperated with the infantile paralysis commission of Harvard University in studying the effect of artificial fever caused by exposure to a condenser field excited by a high-frequency oscillator upon the development of the virus of poliomyelitis.

A special oscillator has been constructed with accessory apparatus by which it is possible, while employing a frequency from 40,000,000 to 50,000,000 cycles per second, to raise the temperature of animals, such as monkeys or rabbits, to 43°–44° C. within a short time. So far the studies have been limited to determining the maximum temperatures and lengths of exposure to which experimental animals may be safely exposed.

Studies of immunity to malignant growths.—The general problem of immune reactions to malignant growths is being studied by Biologist H. B. Andervont.

Previous investigations have repeatedly shown that, in the case of many transplantable tumors, recession of the tumor is followed by resistance to reinoculation.

Experiments at this station, already reported, have shown that mice bearing mouse sarcoma No. 180, rats bearing rat sarcoma No. 10, or chickens bearing the Rous fowl sarcoma which had recovered from these tumors as the result of treatment with high-frequency currents are frequently resistant to reinoculation.

During the fiscal year a study was made of various methods of immunizing laboratory animals against a variety of transplantable tumors.

In the case of mouse sarcoma No. 180 it is believed a new method of immunization was developed which appears to be successful in about 70 per cent of the cases. If mouse sarcoma No. 180 be inoculated into the tail of the animal, the tumor, in this situation, grows much more slowly than when implanted in the usual sites of the groin or the axilla. Nevertheless, the presence of the tumor excites the reaction in the usual way, the diminished rate of growth giving time for its fuller development.

If, then, after a suitable interval, the tail tumor is destroyed by the application of high-frequency currents, or if the tail be simply amputated, the animal is found in a large number of instances (about 70 per cent) to be immune to reimplantation in the usual site (groin or axilla).

Effects of temperature upon the growth of tumors and development of immunity.—The effects of temperature upon the growth of tumors and on the development of immunity were studied during the year. It was observed that when mice inoculated in the tail with mouse sarcoma No. 180 were kept at a relatively high temperature (33°–34° C.) the tail tumor grew much more rapidly and attained a much larger size than in control animals kept at a room temperature of 15°–16°. Although they readily become adapted to this temperature, the tail tumors grew much more slowly than in the animals kept, respectively, at room and at incubator temperatures.

Studies are therefore under way to determine the effect of the temperature of the environment on the development of immunity to mouse sarcoma No. 180. These experiments are still in progress.

Inhibition of the immune reaction.—During the year experiments were undertaken to determine methods by which the immune reaction following the inoculation with a transplantable tumor could be inhibited. Mice were immunized against mouse carcinoma No. 63 by the well-known procedure of injections of emulsions of mouse-embryo skin. The resulting immunity could be "broken down" by the injection of trypan blue, so that the mice treated in this way developed tumors upon inoculation with mouse carcinoma No. 63, while the control animals were resistant to the implantations. While these experiments were in progress a paper was published in Europe by a British investigator reporting similar findings.

Studies of organ extracts.—In the previous annual report mention was made of certain experiments in which the effect of aqueous

extracts of adrenal cortex upon the growth of transplantable tumors was studied. These studies were undertaken because of newspaper reports early in 1930 of the favorable effects on human cancer of an extract of adrenal cortex developed by Doctors Coffey and Humber.

Although no details of the methods of preparation of this extract were at hand, a number of extracts of adrenal cortex were prepared at this station and observations were made of their effect upon the growth of transplantable tumors. No significant effects were observed from the administration of any of these extracts.

Early in the present fiscal year a copy of the patent granted to Doctors Coffey and Humber for their extract was obtained. This document contained a full description of the method of preparation. A batch of the extract was therefore prepared in strict conformity with the specifications of the patent and then tested for any inhibiting action on the growth of transplantable tumors. The extract, prepared according to the Coffey and Humber directions, proved no more effective against transplantable tumors than the other extracts above mentioned.

About this time an effort was also made to confirm the results reported by Arloing and his coworkers to the effect that the adrenals of rabbits prepared by the injection of mouse tumor cells when transplanted subcutaneously into mice would inhibit the growth of transplanted mouse tumors.

No rabbits happened to be available at the time, but rats were used. These would appear to be suitable animals for such an experiment, as they have a strong immunity to mouse tumors. A number of rats, accordingly, were prepared by the repeated injection at suitable intervals of a considerable quantity of the cells of mouse sarcoma No. 180, whereupon their adrenals were transplanted subcutaneously into mice which were simultaneously inoculated with mouse sarcoma No. 180. As controls, a similar number of adrenals from normal rats were transplanted in mice, also bearers of the mouse sarcoma. No differences in the growth of the tumor in both groups of the animals were observed. The rate of growth was the same as in the stock used for the routine propagation of this tumor.

Studies with other extracts.—During the year numerous experiments were made with various forms of organ extracts, especially extracts made from the tissues of mice resistant to transplantable tumors. None of these extracts was found to be effective in inhibiting the growth of transplantable tumors.

Action of frog extract.—A 25 per cent alcoholic extract from tissue of the frog was found by Pharmacological Assistant Henry George to have a considerable inhibitory effect upon the growth of mouse sarcoma No. 180. In mice treated with small doses of this extract which appeared to have no deleterious effect upon the animals, the rate of tumor growth was only about one-half that in a similar number of controls. Although the rate of growth was diminished, nevertheless recessions did not occur.

Biochemistry of malignant cells.—Since the appointment of a biochemist, effort has been mainly directed toward organizing and equipping a chemical laboratory and making a survey of the cancer literature bearing upon the lines of investigation planned.

It is expected that a beginning will be made in the near future by an intensive study of the inorganic constituents of malignant as compared with normal cells, particularly with respect to inorganic constituents which are present in minimal amounts.

In connection with the investigation of immunity, biochemical studies have already been begun concerning the fractionation of extracts of tumor tissue, embryonic tissue, and immune serum with a view to separating substances which tend to favor or to inhibit the generation of immune reactions.

Spontaneous tumor colony.—The colony of mice (Buffalo strain) susceptible to spontaneous tumors, mentioned in previous reports, has continued to grow during the fiscal year notwithstanding a severe epidemic of mouse typhoid. The colony has now attained a sufficient size to begin to offer material for experiment, although the problem of providing adequate space for the suitable expansion of the colony still remains to be solved. Because of the limitations of space it has been necessary to restrict breeding considerably below the natural rate of increase.

Experiments are now under way designed to study the modifying effects, if any, of certain procedures upon the tumor rate. As several months must elapse before the outcome of such experiments can be determined, these must necessarily be the subject of future reports.

PLANS FOR THE FUTURE

Facilities for expansion.—At the present time the Office of Field Investigations of Cancer is occupying practically all the space not otherwise utilized in the department of preventive medicine and hygiene at the Harvard Medical School. The university authorities have assigned to this office the use of six rooms, besides the almost exclusive use of a large laboratory. Nevertheless the quarters are crowded, especially in regard to adequate space for animals. This particularly applies to the colony of spontaneous tumor mice, which should probably be maintained at a population of 5,000 or so if sufficient experimental material is to be available. Although the possibilities for additional room are practically exhausted, future plans contemplate the addition of a cytologist and an assistant biophysicist to the staff.

Inasmuch as the systematic program which has been drawn up has in view the extension of the cancer research work of the Public Health Service, it is evident that future plans must take into account the provision of laboratory facilities commensurate with the importance of this field of investigation.

LEPROSY

The leprosy investigation station at Honolulu, Hawaii, has been conducted under the direction of Surg. N. E. Wayson, with Passed Asst. Surg. J. R. Murdock assisting.

The two medical officers supervise, direct, assist in, or execute all medical activities at the Kalihi Receiving Hospital, adjoining the investigation station. The volume and nature of these activities is reflected by the following statistics:

In-patients, July 1, 1930.....	118
New admissions.....	62
Readmissions.....	12
Escaped patients returned.....	1
Transferred to Kalaupapa.....	4
Paroled to out-patient status.....	23
Patients escaped.....	5
Deaths.....	2
Patients remaining June 30, 1931.....	166

Details of relief measures afforded:

Intramuscular injections.....	3,090
Cutaneous injections.....	322
Intravenous injections.....	65
Physiotherapy treatments (including the application of heat, light, and massage).....	8,748
Diathermy treatments.....	1,067
Surgical operations.....	104
Surgical dressings.....	18,291
Nose treatments.....	1,803
Eye treatments.....	4,420
Physical examinations.....	386
Clinico-microscopical examinations.....	707
Obstetrical deliveries.....	2
Out-patients examined and treated.....	71

Clinical studies.—Efforts to individualize in the study and care of patients have been continued. The experience of the staff of the station for the past 10 years has shown that attempts to treat leprosy specifically with any known remedy is productive of only indifferent results. The results of therapeutic measures during the year give further support to these conclusions. Two groups each of 20 to 25 patients to whom no “special” remedies were administered have made changes which were comparable in degree and duration to those treated by parenteral injections of preparations now recommended. Hence investigations and treatments of patients have been directed toward determining and relieving abnormal conditions which might unfavorably influence their recovery from leprosy. Further studies have confirmed the previously reported prevalence of tuberculosis among the patients. Physical examinations supported by laboratory tests, repeated tuberculin tests, and X-ray photographs have shown that 10 to 12 per cent have manifest tuberculosis, and an additional 15 to 20 per cent have findings which may be considered presumptive of tuberculosis. The continued treatment of these patients by intramuscular injections of irritating substances has been followed by aggravation of the tuberculous infection, and is contraindicated in pulmonary and laryngeal affections. The course of leprosy seems also to be greatly influenced in many cases by the course of a concomitant tuberculosis.

The induction of fever of 37.5° C. to 38.5° C. for short periods by the intramuscular or intracutaneous injection of nonspecific oily substances, such as sulphurized olive oil, has been further studied on a group of cases. This procedure is followed in some instances by leprosy reactions, with subsequent rapid or gradual clinical improvement. However, it is very difficult to evaluate this method of therapy, since other cases similarly treated do not respond in a like manner, and experience indicates with increasing positivity that cases of varying degrees of clinical severity may rapidly improve under hygiene and supportive measures. The parenteral injections

of the sulphurized oil afford a measure for the induction of a fever, which may be controlled to a relative degree by the alterations of the dose administered, but the indications for this therapy and the frequency and amount of dosage have not been finally determined.

It has been found during tests made by the intradermal injection of tuberculin that the usual wheal and infiltrated papule will develop on the tuberculous patient, though the skin be altered by leprous infiltration at the site or indirectly through damaged circulation.

A continuation and extension of the study of the changes in the bones of leprous patients has been carried out by Passed Assistant Surgeon Murdock, with the assistance of Maj. H. J. Hutter, United States Marine Corps, and the cooperation of the medical officer in command of the Tripler General Hospital and of other members of its staff. The findings of these studies confirm those of previous workers, including the staff of this station, but they also contribute evidence of severe, relatively acute, and apparently specific changes which have not been widely recognized. X-ray pictures which simulate the fulminating processes occurring in acute osteitis of pyogenic and tuberculous origin in adolescents have been observed in cases in which clinical evidence of secondary infection was not discovered. These very destructive processes may be followed in a rather short period of time by remarkable morphologic restoration and function. The results of the study will be the subject of a special report which is now being prepared.

Systematic observation and treatment of the manifestations of the disease in the mucous membrane of the nose and throat has led to the belief that many of the complicating inflammations of the eye may be favorably affected by treatment of the lesions of the internal nose. It seems evident also that the application to the nasal membranes of escharotics, fulgurants, radium, and other agents whose action is difficult to control may result in the formation of deep scars which tend to become ulcerated. Such ulcers frequently erode through the cartilaginous septum. Lesions have been observed whose morphology and clinical pathology suggest the likelihood of their being so-called trophic ulcers. The finding of acid-fast bacilli on the nasal mucosa of cases without demonstrable lesions of the membrane has been repeatedly confirmed. It has also been determined that it is probable that the numbers of acid-fast bacilli on these membranes may vary widely at any one period of examination. It also appears that the case which may be apparently quiescent clinically for an extended period, but in whose nasal mucosa the bacillus may be occasionally demonstrated, is prone to have generalized reactivations.

Observations made during the past few years, and more especially during this year, suggest that the course of leprous ulcers, especially of the extremities, is prone to reflect the course of the disease in the individual, namely, as the general condition improves the ulcers heal. However, local supportive treatment, such as strapping with adhesive tape, and posture, which favors venous circulation, appear to be of therapeutic value.

Experimental investigations.—White rats which were injected intravascularly with suspensions of material from lesions of rat leprous developed lepromata or leprous infiltrations which were dis-

seminated generally through the organs and bones. However, a preponderant selectivity for the skin and lungs was evident in both the numbers of granulomata and degree of involvement. The histology of the individual lesions simulated that found in human leprosy. The processes appeared to have originated and spread from the perithelial spaces of the vessels, as might be expected. The selectivity of the sites of development and the resemblance to the histological picture of many of the lesions of human leprosy suggest a further analogy between these two diseases and contribute experimental evidence to the hypothesis that the latter may be disseminated in the body from a local source by the blood stream.

Rats were inoculated by dropping into the nose, without injury to the mucosa, a suspension of either of the organisms of human or of rat leprosy. It was found that either of these organisms will apparently penetrate the mucous membranes of the respiratory tract of these animals and may be recovered in numbers in the cervical lymph nodes, lungs, and spleen of the animals so treated. The cervical lymph nodes are commonly and rapidly affected. Acid-fast bacilli were found in the cervical or mesentery nodes of 15 of 23 animals treated. In 2 animals examined for this purpose organisms were recovered in 17 and 19 hours, respectively, after they were deposited in the nose. Similar findings were not obtained in untreated animals from the same stock pens.

The subcutaneous inoculation of kittens with large doses of suspensions of material from the lesions of human and rat leprosy has been followed by granulomatous tissue reactions. These have become definite and prominent after from 12 to 20 days from the time of inoculation. In some instances both the macroscopic and microscopic appearance of the granuloma has suggested that they were growing when examined as late as 21 days after the date of injection. The results may indicate that the kitten has less natural immunity to these organisms than that which apparently prevails in man and the rat, respectively.

Further efforts have been made to learn the immunological relation of *B. tuberculosis*, *B. leprae*, Stefansky's bacillus, margarine, and mist bacillus. Likewise, experiments have been continued in the attempt to grow the two leprosy bacilli. These studies have not led to any conclusive results.

In cooperation with the department of chemistry of the College of Hawaii investigations were made of a preparation reported to be a water-soluble derivative of chaulmoogric acid. The hypothesis advanced by the college authorities is that it readily hydrolyzes and will do so in the tissues, and deposit chaulmoogric acid, which is presumed to be antagonistic to the growth of the bacillus of leprosy. Tests were made by suspending material from the lesions of rat leprosy in a 2 per cent solution of the preparation and allowing it to act for a period of 17 hours at 5° C. (the low temperature is necessary to inhibit the growth of other bacterial contaminants), subsequently washing the tissue suspension with tyrode solution and injecting it into rats. All the animals developed typical lesions of rat leprosy to a degree entirely comparable with that of control animals inoculated with material which had been handled in a like manner, except that it was exposed to the action of water only. Other tests were made to determine the toxicity of the product. The

lethal dose was found to be very inconstant in different dilutions and in different batches of the same dilution. Rats which were inoculated with material from rat leprosy lesions, and promptly treated by intramuscular injections of the preparations during a period of four months, developed the disease in a manner and to a degree entirely comparable with others handled similarly but not treated by the preparation.

Other activities.—Surg. N. E. Wayson represented the Public Health Service in the conference of the leprosy commission of the League of Nations at Bangkok, Siam, and served as a member of the international conferences at Manila, under the auspices of the Leonard Wood Memorial.

A case of suspected plague was investigated, and technical procedures were outlined at the request of and in cooperation with the chief quarantine officer of Honolulu.

A series of clinics for the local medical profession and a clinic for public health nurses and social welfare workers have been conducted.

MALARIA

Field investigations of malaria have continued under the direction of Surg. L. L. Williams, jr. The aim of field research in malaria and malaria control has always been to so reduce the cost of effective measures that the rural population might afford to protect themselves against infection.

PARIS GREEN

Continuous dusting.—In cooperation with the State board of health and local authorities, a study of continuous dusting was inaugurated in the early summer of 1929 in Dougherty County, surrounding Albany, Ga. Surg. T. H. D. Griffiths was placed in immediate charge and was assisted by Sanitary Engineer W. H. W. Komp until April, 1931.

The aim of this study has been to determine whether dusting all the *Anopheles*-producing areas within the county every 10 days with Paris green diluted to 10 per cent in lime would so reduce the number of *Anopheles quadrimaculatus* as to control malaria. The details of the method of procedure have been described in the 1930 annual report. The results of this year's progress indicate a considerable degree of success. Before dusting, the average *quadrimaculatus* catch at a typical catching station was 32.4. During the past year this has been held to 6. The results in malaria reduction compared to the adjoining county of Lee, where no dusting has taken place, show that the Dougherty County malaria rate has fallen from over 40 per cent to less than 7, whereas Lee has fallen from 24 to 11 per cent. These figures were obtained by blood examination among the rural school children. Although the difference in the malaria rate between the two counties is not as great as might have been expected, it must be remembered that the unusual drought of the summer of 1930 enormously reduced the mosquito-producing areas of the undusted county. Drought conditions have not prevailed at the end of the present fiscal year, and indications are that the coming year will be about normal. It is intended that a fall

index shall be taken early in the next fiscal year and the study brought to a close.

Intermittent dusting.—In cooperation with the Tennessee State Board of Health, studies of intermittent dusting have been carried on under the immediate direction of Sanitary Engineer J. A. LePrince and Passed Asst. Sanitary Engineer H. A. Johnson, in Dyer County, surrounding Dyersburg, Tenn. The details of this investigation were described in the 1930 annual report.

This study differs from the Georgia investigation in that the interval between Paris green applications is 21 days instead of 10. Intermittent dusting at approximately 3-week intervals is based upon the observation that, when production from breeding areas is stopped, the death rate of the previous crop of *Anopheles* is greatly accelerated. Although production is immediately resumed and the number of adult mosquitoes is quickly brought to the maximum, there is a minimum of the earlier broods, and therefore a minimum chance of containing an infected *Anopheles*.

As in Georgia, it is intended to continue the study during the summer of 1931, take a blood index in the fall, and bring the study to a close. However, should the results of blood indices taken within the dusted county be closely paralleled by the malaria rate in the adjacent nondusted county of Lauderdale, it will be necessary to continue the investigation.

Flotation.—This study was begun by Special Entomologist A. L. Dolloff during the summer of 1929 and continued through the fiscal year 1930, but with no positive results. It was independently studied by Passed Asst. Sanitary Engineer H. A. Johnson with certain forms of floating Paris green which have been treated with small quantities of oils. His work has confirmed that of Doctor Dolloff and has simplified the process of mixing. There are as yet undetermined factors necessary of solution before complete dependence can be placed upon flotation of Paris green. Therefore this study is being continued.

OTHER STUDIES

Plasmochin.—Ever since Doctor Barber showed that small doses of plasmochin so reduced the viability of the gametocyte of estivo-autumnal malaria as to prevent its infecting mosquitoes, we have been attempting to determine whether it would be similarly effective applied to benign tertian. This work has been under the direct supervision of Sanitary Engineer W. H. W. Komp. During the present fiscal year it has been impossible to secure proper benign tertian gametocyte carriers, and therefore no progress in the study could be made. In order to have a longer malaria season in which to pursue this study and to cooperate in studies of the bionomics of *Anopheles* and special studies in malaria, Mr. Komp has been detailed to Panama to work in cooperation with the Gorgas Memorial Laboratory and the Health Department of the Panama Canal.

Measuring malaria.—A necessary part of the field studies is accurately to measure malaria within the area of attempted control, as well as in near-by areas of no control. For this purpose our thick-film laboratory has been continued. Eighteen thousand blood slides have been examined and 38,000 have been stained. Twelve thou-

sand of these slides were stained for the State of Texas for examination in their own laboratory by a microscopist trained by our workers.

Malarial inoculation in paresis therapy.—The most successful treatment of paresis is to induce an attack of benign tertian malaria. Institutions for the insane frequently lose their strain of malaria and are confronted by difficulties in securing a new one. In cooperation with the Venereal Disease Division we are working to develop methods of supplying inoculation material. Through the cooperation of the State hospital for the insane at Columbia, S. C., we have set up a field laboratory under the immediate supervision of Special Expert Bruce Mayne.

Preliminary investigations have been made to determine the present inoculation procedure at the various psychiatric hospitals in order that our studies might develop methods to overcome difficulties now experienced.

We do not know (1) what method of inoculation will most certainly insure an infection, (2) the best method of keeping a good strain indefinitely, and (3) what is the most effective way for shipping a live strain of malaria to distant points of the country. It will be necessary to determine the feasibility of supplying the infection from a central point and to test the viability of the malarial organism in the mosquito's body after the mosquito has been ground up in various media.

NUTRITIONAL DISEASES

The studies in nutrition were continued both at the Milledgeville State Hospital (formerly the Georgia State Sanitarium), Milledgeville, Ga., and at the National Institute of Health, Washington, D. C.

The studies at the Milledgeville State Hospital, under the direction of Surg. G. W. Wheeler, have consisted largely of the determination of the relative pellagra-preventive potency of single staple foods and foodstuffs by feeding experiments in the human.

The study of canned turnip greens and canned spinach, begun during the preceding fiscal year, was completed and the results presented for publication.

It was found that canned spinach contains the antipellagic vitamin, but the addition of 482 grams (including the can liquor) to an otherwise pellagra-producing diet was not quite sufficient for complete protection against the disease.

The same quantity of canned turnip greens (including the can liquor) showed complete protection. This result is considered highly practical from the standpoint of pellagra control. This foodstuff is usually well relished and may be cheaply and easily grown throughout the pellagrous sections (rural cotton belt) and may be made available at the time of year (spring and early summer) when the diet is most restricted and pellagra most prevalent. With a small amount of well-directed effort on the part of local health agencies and others concerned, its production and consumption may be increased almost indefinitely.

Canned green stringless beans were tested for their pellagra-preventive value and the results presented for publication. While the antipellagic vitamin is present in this foodstuff, it must be regarded as a relatively poor source of it.

A test of canned English peas, begun early in the fiscal year, is still in progress.

In cooperation with the clinical director of the Milledgeville State Hospital a test of the influence on idiopathic epilepsy of a diet low in the pellagra-preventive vitamin was conducted. It was found that, coincidentally with the development of pellagra, there was, in most instances, a sharp reduction in the number of epileptic seizures which, however, returned to the usual level upon recovery from pellagra. A full report of this study was published in Public Health Reports for April 10, 1931 (Reprint No. 1468).

Cooperation has been extended to various individuals and agencies interested in combating pellagra, more especially the home economics and nutrition services of the Georgia State College of Agriculture and the Spartanburg County (S. C.) Health Department.

The studies at the National Institute of Health under the direction of Passed Asst. Surg. W. H. Sebrell have been, in part, a further continuation of the program inaugurated by the late Surg. Joseph Goldberger, of testing individual foodstuffs, particularly in the dog in order to determine their probable pellagra-preventive value. This work has been supplemented with studies on the antineuritic vitamin and feeding experiments with purified amino acids. During the fiscal year a special report was made of the blacktongue preventive value of Minot's liver extract (Public Health Reports for December 12, 1930: Reprint No. 1433). The results of this work demonstrated that Minot's liver extract contains the antipellagric vitamin, and therefore would probably be of some value in the treatment of pellagra.

Tests of the blacktongue preventive action of fresh cabbage, lettuce, canned turnip greens, autoclaved cottonseed meal, canned spinach, and rice polishings were completed during the fiscal year.

Tests of canned evaporated milk, collard greens, canned corned beef, navy beans, kidney beans, and Irish potatoes are in progress at the close of the fiscal year.

Studies on the fatty degeneration of the liver in dogs were completed, and the results indicate that the condition is probably due to some dietary deficiency. It is expected that the results of these experiments will be given in a special report.

In collaboration with Senior Chemist E. Elvove, of the Division of Chemistry, the following experiments were conducted:

Studies of the anemia-producing substance in onions were continued, and the results to date indicate that the active material probably resists steam distillation and may be extracted with dilute alcohol.

Studies in the rat led to the development of an intraperitoneal method of injection of antineuritic concentrates, and the preparation and assay of several antineuritic concentrates was made the subject of a special report (Public Health Reports, April 17, 1931; Reprint No. 1470). Attempts to develop a satisfactory rat method for determining the presence of the antipellagric vitamin are progressing slowly.

In collaboration with Biochemist M. X. Sullivan and Junior Chemist W. C. Hess, of the Division of Chemistry, studies were begun on the feeding of purified amino acids. A report on the sub-

stitution of cystine amino for cystine in the diet of the white rat was published (Public Health Reports, May 29, 1931; Reprint No. 1479). It was found that cystine, tyrosine, and glycine in relatively large amounts are toxic to white rats, and that tyrosine and cystine tend to counteract the toxic effects of each other when fed simultaneously. The symptoms of tyrosine toxicity were found to be strikingly different from those of cystine toxicity. A report on the results of these experiments is in the course of publication.

In collaboration with the National Drought Relief Committee, Passed Asst. Surg. W. H. Sebrell served on the subcommittee on nutrition information, and assisted in the preparation of Department of Agriculture Extension Service Circular No. 139, Buy Health Protection With Your Food Money, published in November, 1930.

ROCKY MOUNTAIN SPOTTED FEVER

The studies of Rocky Mountain spotted fever and associated tick-borne diseases of man being carried on at the Hamilton (Mont.) field station under the direction of Special Expert R. R. Parker have been characterized by the same continued growth of activities under way and the same increasing demand for services which have marked this work during recent years.

The Public Health Service has been almost continuously engaged in the study of tick-borne infections in the United States since 1903. During this period the problem has grown from one supposedly concerning only one tick, *Dermacentor andersoni* Stiles, and its transmission of Rocky Mountain spotted fever in a limited portion of the Rocky Mountain region to one involving at present several diseases of man, their transmission by a number of species of ticks, and a tremendous increase in the area within which these diseases are known to be endemic. Besides *Dermacentor andersoni* Stiles, it is now known that Rocky Mountain spotted fever is transmissible by the American dog tick, *Dermacentor variabilis* Say, *Dermacentor occidentalis* Neumann, and the rabbit tick, *Haemaphysalis leporispalustris* Packard. Since the initial studies *Dermacentor andersoni* has apparently extended its range considerably in some sections, pushing out beyond the Rocky Mountain region; *Dermacentor variabilis* is prevalent in most of the Central, Eastern, and Southern States and in California and southern Oregon; *Dermacentor occidentalis* occurs throughout California and in southwestern Oregon; *Haemaphysalis leporispalustris* is country-wide, but fortunately does not bite man and functions only in the maintenance of Rocky Mountain spotted fever virus and tularaemia in nature; tularaemia is transmitted by the same four ticks; tick paralysis and Colorado tick fever have been reported only following the bite of *Dermacentor andersoni*. Tularaemia is not solely a tick-borne disease. This disease, first found in California only 20 years ago, is now known to occur in all but five States, and *Dermacentor andersoni* and *variabilis* are among the proved agents of human infection. Tick paralysis, originally reported from eastern Oregon, is now known in five additional States of the Rocky Mountain region and in Canada, and is doubtless even more widely distributed. Colorado tick fever has been reported only from the States of Colorado

and Wyoming. Ticks are also responsible for numerous instances of local and systematic pathological conditions of uncertain nature, while in many sections of the Rocky Mountain region the actual or potential economic effects of the occurrence of these infections are serious.

Along with the increasing knowledge of the extent and importance of tick-borne diseases in this country there has been a corresponding increase in the demand for the services rendered by the Hamilton (Mont.) laboratory. This has resulted in an expansion of station activities, and a corresponding increase in personnel to a point where the resultant laboratory space requirements are not available to the Public Health Service in the Montana State Board of Entomology Laboratory. Additional space to meet the need created by these demands has been provided for by an act passed by the Seventy-first Congress, permitting the purchase from the State of Montana of this laboratory building, which is especially designed and constructed to meet the specialized requirements of work with ticks, and also for the erection of an additional building similarly constructed for the sole use of the Public Health Service.

Arrangements have been made for temporarily taking over on July 1, 1931, research studies on tick parasites which were initiated five years ago by the Montana State Board of Entomology.

The amount of vaccine manufactured has been doubled during each of the past four years. For the season 1931, 117.2 liters were prepared, as compared with 55 liters in 1930. This amount was intended to meet an estimated minimum demand of 50,000 c. c. This discrepancy between the amount manufactured and estimated minimum demand is unavoidable, since experience has shown that allowance must be made for a possible 50 per cent loss because of low potency. Unfortunately, it has thus far proved impossible to produce a constantly potent product, even when the technique used is always the same. The reasons for this variation in potency are not known. In previous years vaccine has been manufactured largely from adult ticks which had been infected as larvae. This year a comparison has been made between vaccine thus prepared with vaccine made (1) from adults infected as nymphs and (2) from adults which fed on infected hosts as both larvae and nymphs. This one year's data suggest that vaccine from ticks infected by either of the last two methods is likely to be more constantly potent than that from ticks infected as larvae; and it is possible that some simple change in technique, such as that indicated by the above finding, may mean the production of a more nearly standard product. If this can be done, the cost of manufacture can be reduced materially, since a constantly potent vaccine would halve the volume of production now necessary and would also make possible its manufacture in much larger units (the present unit is 400 c. c.), with a saving of at least 1,000 laboratory animals every year. Attempts to culture the virus in the hope that a more simple method of vaccine production might be developed have proved abortive.

The season of 1931 is the first since the use of the vaccine was begun in 1925, during which it has been possible to fill all orders. The amount distributed through June of this year was 54.1 liters, as

compared with 31.2 in 1930. This quantity of vaccine has been distributed in 17 States, the heaviest users being Montana, 16.24 liters; Oregon, 14.25; Wyoming, 11.1; and Idaho, 7.5. The other States listed in order of amount of vaccine used are as follows: Nevada, Colorado, California, Washington, Utah, New Mexico, South Dakota, Nebraska, Maryland, Massachusetts, Pennsylvania, Minnesota, and Missouri. For the most part the vaccine is forwarded directly to the physicians who use it, but it is also distributed to some extent through State and local health officials.

It seems certain that the demand for vaccine will continue to increase. So far as the Rocky Mountain region and adjacent areas are concerned, it has grown rapidly during the past two seasons, in spite of a decreasing prevalence of fever. It has not been unusual to supply single physicians with sufficient vaccine for from 100 to 200 persons. If the prevalence of Rocky Mountain spotted fever in this section conforms to the recent cycles, gradually increasing prevalence may be looked for during the next five years, reaching a peak in 1936, and it is likely that the vaccine demand will increase proportionately. To what further extent this foreseen demand will be increased by the now recognized occurrence of what is apparently Rocky Mountain spotted fever in eastern States, it is difficult to judge, but since the disease in these States appears to be limited to focal areas the use of vaccine would appear to be logical. In the West there is an increasing tendency for companies and corporations employing men in capacities which expose them to tick bites either to insist on vaccination or to make certain at least that the vaccine is available for such employees as desire to take it. There is also an increasing demand among Federal employees in exposed occupations.

In discussing the results of the use of the vaccine it is necessary to differentiate between vaccination in areas where relatively mild infections prevail and those in which the local strains of virus are extremely virulent, with an accompanying high death rate. Additional data resulting from the present year's use do not indicate any modification of the general conclusions as to prophylactic value which have been previously made, namely, that against the milder strains of Rocky Mountain spotted fever the average person is fully protected, but that against the highly virulent type the protection afforded is usually but partial, though sufficient to markedly ameliorate the symptoms and insure recovery. Among approximately 25,000 persons vaccinated against the milder strains only two mild cases have occurred, while in localities or groups which have been adequately controlled the evidence of usual full protection has been convincing. In the Bitterroot Valley region of western Montana seven years' complete data are available of persons vaccinated against the most fatal strains known. During this period there have been 54 local cases, of which 36 were in nonvaccinated and 18 in vaccinated persons. Of the nonvaccinated cases 26 have died, a mortality of 72.22 per cent; of the vaccinated cases 3 have died, a mortality of 16.66 per cent. Of the persons vaccinated in this region many have been vaccinated two, three, four, five, and six successive years, and several cases have occurred in persons vaccinated two or more consecutive seasons. The clinical data for these cases suggest that in some persons, but not in all, there is a gradually increasing degree of immunity resulting from consistent annual vaccination.

Most cases in vaccinated persons have occurred in those vaccinated the same year as infected. Two 1931 cases, however, were in persons who had omitted vaccination for the current year. For one of these no data are available. The other, a case occurring in the Bitterroot Valley region, was vaccinated in the two preceding years. Clinically, this case was the mildest local case ever observed in a person not vaccinated the same season as infected, this mildness being definitely attributable to a persisting partial protection. It is possible some degree of immunity persists for more than one season in a higher percentage of vaccinated persons than has thus far been supposed.

Reports from physicians in areas where mild infections prevail, and where the incubation period is frequently 7 to 10 days or longer, indicate that in persons vaccinated soon after the bite of an infected tick the course of infection may be alleviated and shortened and convalescence be more rapid. Similar evidence is favorable, though less conclusive, in the case of persons bitten by ticks carrying highly virulent strains, for which the incubation period is usually only 3 to 5 days. The result will doubtless vary with the individual, but in any event present evidence suggests that, whether against mild or severe strains, vaccination immediately following tick bite is definitely worth while.

EPIDEMIOLOGY

So far as indicated by 1931 reports thus far received, Rocky Mountain spotted fever in the western United States is at a low point of prevalence; previously low points occurred in 1924 and 1917. Montana is the only State showing increased incidence for the year.

Reasonably convincing evidence that second infections of Rocky Mountain spotted fever may occur has been secured. It is likely, however, that the idea generally held that infection confers an immunity of long duration is justified in most cases.

STUDIES OF ROCKY MOUNTAIN SPOTTED FEVER VIRUS IN NATURE

Ecological investigations being made on the east and west sides of the Bitterroot Valley in connection with the studies planned to determine the factors responsible for the constant regional virulence of Rocky Mountain spotted fever have been continued. These are long-term studies, from which definite results, if obtainable, are not expected for some years. The most important observation resulting thus far has been the definite demonstration that Rocky Mountain spotted fever virus is able to maintain itself in ticks in nature as a low-grade virus. It has been possible to demonstrate it in rodents on which east-side ticks have fed, but thus far transmission from ticks through rodents and back to ticks has not been accomplished.

The demonstration of the natural maintenance of this type of Rocky Mountain spotted fever virus is important, since it shows that a low-grade virus incapable of producing symptoms in man can persist in an area without its presence being suspected. Apparently, then, it is possible that many instances of case occurrence in areas previously thought free of infection may be due to an increase of virulence of low-grade local strains rather than to spread of infection from a more or less distant focus. How extensively low-grade virus

of the inapparent infection type may be present in ticks in sections of the United States in which Rocky Mountain spotted fever is not now known to be endemic is a question which only future observations can decide. The possibilities in this direction, however, are indicated by the fact that studies under way at the Hamilton (Mont.) station in cooperation with Dr. R. G. Green, of the University of Minnesota Medical School, have revealed the occurrence of this type of Rocky Mountain spotted fever virus in about 1 per cent of several hundred specimens of *Dermacentor variabilis* collected near Lake Alexander, north of Cushing, Minn.

In connection with the studies on virulence it has been necessary to devise a scale by which the degree of virulence of Rocky Mountain spotted fever virus in individual ticks can be measured. To this end the reaction of guinea pigs injected with individual ticks is utilized.

In further connection with these studies, tests were initiated in the spring of 1931 to determine whether or not Rocky Mountain spotted fever virus is being transmitted in nature by parasites other than ticks. Numerous *Anophura*, *Siphonaptera*, and *Acarina* collected from susceptible Bitterroot Valley rodents have been tested, thus far with negative results.

LABORATORY STUDIES OF ROCKY MOUNTAIN SPOTTED FEVER

The following strictly laboratory investigations have been made in connection with the Rocky Mountain spotted fever studies: Complement fixation; the effect of vitamin-free diet on the course of infection in guinea pigs; the adsorption and elution of antibodies; the complement and hemolysin content of convalescent serum of guinea pigs and man; precipitin antisera for the specific determination of blood meal in ticks; bactericidal properties of immune sera for *Proteus X* organisms; continuation of observations on the Weil-Felix reaction with available strains of *Proteus X*; attempts to isolate *Proteus X* organisms, which might be more specific for Rocky Mountain spotted fever than those now in use, from the urine of human cases and infected guinea pigs; transmission of the virus by copulation between male and female *Dermacentor andersoni*; transmission by mosquitoes; transmission by fleas; transmission by excreta of infected *Dermacentor andersoni*; transmission by *Rhipicephalus sanguineus*.

TULARAEMIA

The danger of laboratory infection with tularaemia is an acute problem incidental to the work being carried on at the Hamilton (Mont.) station. Twelve infections have thus far occurred among the laboratory staff, four of them, one fatal, during the present fiscal year. The majority of these cases have resulted from direct or indirect contact with ticks collected from nature in which infection was not suspected. These infections, which are a danger inherent to the work being carried on, are a constant menace to the physical well-being and even the life of staff members, besides causing a serious disruption of the station work. Considerable time and effort have therefore been expended during the year in attempts to prepare a vaccine. All experimental products used have either proven useless or have resulted in definite sensitization.

The following animals not previously reported have been tested for susceptibility: Black bear (*Ursus americanus*), apparently mildly susceptible; black-footed ferret (*Mustela nigripes*), highly susceptible; mountain weasel (*Mustela arizonensis*), highly susceptible; owl (probably *Strix occidentalis*), mildly susceptible; mallard duck (*Anas platyrhynchos*), marked difference in susceptibility of individual birds; and magpie (*Pica pica hudsonica*), young birds apparently highly susceptible.

Tests to determine the transmissibility of tularaemia by mosquitoes have proved abortive except for a single instance of mechanical transmission by *Aedes aegypti* Linnaeus. In tests with *Aedes vexans* Meigen, infectious excreta were recovered 1 day after feeding on an infected host, while viable organisms persisted in the body for 15 days. Several instances of suspected human infection through the agency of mosquitoes have been reported. The experiments thus far made, however, suggest that infection by this means is probably unusual.

Additional laboratory studies have been made as follows: The effect of various preservatives on the agglutinability of *Bacterium tularensis*; the bactericidal properties *in vivo* and *in vitro* of sera from convalescent cases and rabbits "vaccinated" with *Bacterium tularensis*; the presence of a heterophile antigen in *Bacterium tularensis*.

Tests of western Montana ticks and reports from the eastern portion of the State, when compared with data of recent seasons, indicate a gradually increasing incidence of tularaemia infection in *Dermacentor andersoni* during the past two years. This suggests that there is an increasing prevalence of the disease in nature in Montana and that a resulting increased danger of human infection may be anticipated during the next few years.

TICK PARALYSIS

Tick paralysis in man, which was unusually prevalent in 1930, has been reported but a few times during 1931. A considerable outbreak in sheep in Park County, Mont., was investigated, without significant findings.

CHILD HYGIENE INVESTIGATIONS

The activities of the Child Hygiene Office were continued under the direction of Acting Asst. Surg. E. Blanche Sterling. These included studies in (1) the mental hygiene of childhood; (2) the vision of school children; (3) dental caries; (4) statistical studies in the physical status, growth, and development of school children; and (5) miscellaneous and cooperative work.

THE MENTAL STATUS OF CHILDREN OF VARIOUS TYPES OF BIRTH

The study of the mental status of children of various types of birth, begun in March, 1930, made satisfactory progress during the fiscal year 1931. The generous cooperation of the Johns Hopkins Hospital throughout the year has been most gratifying. The records of the obstetrical clinic of Dr. J. Whitridge Williams were made

available for our study, and over 5,000 obstetrical histories have been obtained from these records.

Of this number approximately 4,000 were spontaneous deliveries, the remainder consisting of forceps deliveries, breech births, Cesarean sections, and version and extraction cases. The children of these births furnish the clinical material of the investigation.

A special detailed outline for the study of these children was prepared which will facilitate the acquisition of a large amount of data.

Various social agencies in Baltimore have furnished information concerning many of these cases. One of these agencies supplies a worker to read and abstract their records for this study.

A large amount of work is involved in the study of these children; and the investigation of their family history, significant experiences, home environment, developmental history, medical history, personality traits, behavior record, and school life will be added to the obstetrical history of the mother. When these factors are correlated with the type of birth, some light may be shed upon the effect on the child of various obstetric procedures.

A STUDY OF CHILDREN OF PATIENTS IN STATE HOSPITALS FOR THE INSANE

It was felt that a study of children of patients in State hospitals for the insane might be of definite value to those States which are planning the extension of their mental-hygiene service. In view of the need of further research in the mental hygiene of childhood, the Child Hygiene Office began in the last quarter of the fiscal year a study of the children of patients in mental hospitals in Maryland. This study is under the immediate direction of Dr. George H. Preston, Maryland State commissioner of mental hygiene and a consultant of the Public Health Service.

By means of this study it is hoped the following questions may be answered: (1) Do children living with family groups which have contained definitely psychotic persons show potentially psychotic behavior, delinquency, school maladjustment, or personality problems to a greater extent than children who have not been associated with psychotic adults? (2) Do any significantly causative relationships exist between the behavior of children and the presence of psychotic adults in the family group? (3) Do children living in family groups which contain psychotic adults constitute a responsibility which should be met by some specific public health or welfare agency or by some designated member of the hospital staff?

THE VISION OF SCHOOL CHILDREN

The study of the vision of school children, in progress for several years, came to an end with the close of the fiscal year.

One of the primary objects of this investigation was to determine the changes, if any, which may occur in the eyes of rapidly growing children who are constantly calling on their eyes for more intensive work as their school life progresses. At the close of the study we had secured two tests of 1,000 children, the majority with an interval between the examinations of approximately two years. An addi-

tional 500 children had had three tests, many covering approximately a period of four years.

At the present time the data seem to indicate that myopia increases to a fairly marked extent from 8 to 12 years of age. The cases of myopia are increased mainly by hyperopic cases becoming myopic. Many myopic cases increase in degree; and hyperopic cases, as well as cases of hyperopic astigmatism, have increased in some instances and decreased in others.

Many of the children examined showed marked defects of vision, while others revealed minor deviations from the normal.

DENTAL CARIES IN RELATION TO DIET AND CLIMATE

The study of dental caries in relation to diet and climate, begun in the preceding fiscal year, made marked progress during 1930-31. In October and November a special effort was made to secure dental records of children in presumably climatically unfavorable sections of the country. Through the courtesy of the United States Coast Guard, it was possible to visit the remote station at Neah Bay, on the Strait of Juan de Fuca, and some much-desired data from the cloudy section around Puget Sound were obtained.

In the spring dental records were obtained from Wisconsin and South Dakota. Over 4,000 records have now been obtained from various sections of the country. The completed study will probably include at least 6,000 records.

The data relating to the diet of the mothers of the children studied, as well as that of the children themselves in their early years, have been compiled. Interesting information concerning breast feeding among the Indian tribes and the feeding habits of both adults and children have been obtained.

PREVALENCE OF DENTAL DECAY AMONG NEGRO AND WHITE CHILDREN OF THE SAME LOCALITY

The statistical study, conducted by Acting Asst. Surg. Amanda L. Stoughton, is an analysis of the oral examinations of 997 negro and 3,112 white school children in Orange County, Fla. The study indicates that the extent of dental decay was less among negro than among white children, but that the white children received much better dental attention. This report is the third in a series on the prevalence of dental caries.

THE PHYSICAL STATUS, GROWTH, AND DEVELOPMENT OF SCHOOL CHILDREN

Much advancement was made in the statistical analysis of the extensive data on the physical status, growth, and development of school children obtained in the course of the United States Public Health Service child hygiene studies in Hagerstown, Md.

There is in progress an analysis, by age and sex, of the sickness records and the physical measurements. This will include a study of seasonal sickness and the influence of sickness on change of weight. The study of physical measurements will include the mean measurements of each sex at different ages and the average annual and seasonal increments in various measurements.

COOPERATION WITH OTHER AGENCIES

During the fiscal year the cooperation of the Child Hygiene Office has been chiefly as follows:

With the Girl Scouts of the District of Columbia: As in the preceding 10 years, physical examinations were conducted of the girls who registered for attendance at the Girl Scouts camp. At the close of the fiscal year, 266 such examinations had been made. In addition about 30 of the Scouts were examined as a prerequisite to swimming during the season between encampments.

With the American Association of University Women: Material on child hygiene was furnished for use by study groups composed of members of the association.

With White House conference committees: Articles on the work of the Public Health Service were prepared for the Committee on Parent Education and the Committee on Maternal and Infant Care.

With the Neighborhood House: Fourteen children in the day nursery and kindergarten of the institution were given physical examinations.

MISCELLANEOUS

Through direct correspondence from the Child Hygiene Office, health education material has been sent out in response to requests from all parts of the country. The correspondence during the fiscal year amounted to approximately 13,500 letters.

In addition to the activities mentioned, an outline for a school health program was sent to the Canal Zone. Papers were read at the twelfth annual conference of the National Federation of Organizations for the Hard of Hearing, at Chicago, Ill., and at a parent-teachers' meeting at the Maryland State Normal School, and lectures on child hygiene were given at the National Institute of Health.

INDUSTRIAL HYGIENE AND SANITATION

The activities of the Office of Industrial Hygiene and Sanitation were carried out under the direction of Surg. L. R. Thompson until he was relieved from duty on August 15, 1930, and since October 27, 1930, under the direction of Senior Surg. J. P. Leake.

DUST STUDIES

Municipal dust.—In order to determine the effect of municipal dust upon the health of the inhabitants, a study was made of the rate of sickness occurring among two groups of New York city street cleaners, one working in lower Manhattan and the other in a residential district of Brooklyn. The dust to which the first group was exposed (about 4,000,000 particles per cubic foot of air) was taken as representing the maximum that the average city dweller might be subjected to.

The sickness rates of the street sweepers were neither high nor low when compared with sick benefit association experience and the results of the other dust studies. In addition, using the sweepers in Brooklyn as an immediate control from the standpoint of dust ex-

posure, no excess in the sickness rate from respiratory or non-respiratory diseases was found.

A report of this investigation will be submitted for publication as a Public Health Bulletin.

Effect on health of cotton-cloth manufacturing.—This investigation, report of which will be submitted for publication, gives a fairly accurate picture of the amount and character of dust and the temperature and humidity conditions which one may expect to find in a cotton-cloth-manufacturing plant in the Southern States in which air conditioning (apart from the introduction of moisture) is not used. The lack of any relationship between dust and minor respiratory diseases in this study bears out the observations obtained in the other studies as to the health of workers in the dusty trades. A possibly significant excess of asthma was found; a mild, nondisabling fibrosis was quite prevalent, as indicated by X rays.

The observation by English investigators, to the effect that there was no excess of sickness in the humid sheds compared with the non-humid sheds, seemed to be borne out in this study, although workers in this investigation were exposed to a much more severe condition of temperature and humidity.

Silverware manufacturing.—With the exception of a very few occupations, dust exposure in the silverware-manufacturing plant studied was very low in comparison with most of the other dust studies.

Comparison of morbidity rates by specified respiratory cause with rates found in the other dust studies showed that silver polishing had a comparatively low respiratory rate and no excess from any specific cause. Comparison with rates in a rubber company (with no industrial hazard predisposing to respiratory illnesses) showed no significant differences.

Hard and soft coal.—The report of these investigations was practically completed during the year.

Laboratory studies in pneumoconiosis.—Laboratory studies on the effect of dust of varying kinds and concentration were continued.

Study of the efficiency of ventilating devices in the removal of dusts and gases.—The current investigation in this series has to do with the determination of the relative degree of hazardoussness of sand-blasting operations. Complete surveys were made of 25 industrial establishments located in Connecticut, Michigan, Illinois, and Wisconsin, and were so planned as to include a proportional representation of various manufacturers' equipment and various types of equipment in different kinds of establishments, such as foundries, enameling plants, and car-cleaning plants. The data gathered consisted of complete sanitary surveys of each workroom studied, ventilation studies, data on sand-blast equipment, occupational analyses, and histories of workers. Two hundred and five atmospheric dust samples were collected to show the dust exposure associated with various sand-blast occupations and equipment. Samples were also obtained and analyzed for the mineralogical composition of the dusts encountered in the study and, finally, samples of atmospheric dust were procured for particle-size measurement. Experimental tests of positive-pressure air helmets were also made. The study was made in cooperation with a committee of the National Safety Council.

OTHER STUDIES ON HEALTH IN INDUSTRY

Frequency of pneumonia among iron and steel workers.—Reports of sick-benefit associations to the Public Health Service revealing consistently higher pneumonia incidence rates in the iron and steel industry than among industrial workers as a whole led to an intensive study of pneumonia among the employees of a large steel plant in Pennsylvania. The disease was found to occur with abnormal frequency among men exposed intermittently to extremely high temperatures, among those working outdoors in all kinds of weather, and among persons exposed to humid, drafty conditions, such as were encountered in the chipping sheds. The coal miners and their helpers also experienced pneumonia at higher than average frequency. A factor in common in these different occupations appears to be liability to sudden cooling or chilling of the body as an occurrence of greater frequency than among persons not exposed to such conditions. Other factors in the working environment, such as gases, smoke, and dust, appeared not to be associated appreciably with a high incidence of pneumonia (with certain exceptions), and such nonoccupational factors as age, race, and economic conditions did not account for the major part of the excess incidence. A conservative estimate of the excess number of cases of pneumonia among 428,000 men employed in blast furnaces, steel works, and rolling mills in the United States over that experienced by an equal number of men in other industries is 642 per year (the rate being 4.3 per thousand, as against a normal rate of 2.8), and the number of excess deaths about 160 annually. Few specific diseases of occupation cause so many serious illnesses or so many deaths per year.

Studies of the hazards in the radium-dial-painting industry.—Analysis of the data obtained in this investigation was completed during the year. A discussion of the subject was given before the American Medical Association in May, 1931, in which the conclusion was reached that there is evidence of the accumulation of radioactive material even under the improved conditions which have obtained since 1926. The amounts of radium found in the workers are small relative to those amounts previously noted in serious or fatal cases of radium poisoning, and there is no indication that any individual employed since 1926 only has been injured. The evidence does, however, show the necessity for a still further and marked reduction of the exposure to prevent further accumulation and to provide a sufficient factor of safety under varying conditions.

Lead poisoning.—Data were obtained in an investigation of the nature and severity of the effects of exposure to the lead hazard in a storage-battery plant, and an analysis of the material is in progress.

Tetraethyl lead gasoline.—Observations in regard to the use of tetraethyl lead gasoline were continued.

Methanol as an antifreeze.—A possible hazard from methanol (methyl alcohol or wood alcohol) used as a substitute for denatured ethyl alcohol to prevent freezing in automobile radiators has been brought to the attention of the Public Health Service on several occasions.

The Bureau of Mines, under an agreement with the manufacturers of synthetic methanol, had undertaken a study of the toxicity of

methanol. The Public Health Service made brief, independent field observations as to the extent of the hazard.

In accordance with a request from the conference of State and Territorial health officers to the Public Health Service to reach an agreement with the industry for the adoption of safeguards, representatives of the industry were asked to meet with representatives of the United States Public Health Service to discuss the matter. Following this conference a preliminary suggested agreement was sent to the manufacturers, and by the latter part of June favorable replies had been received from so many of them that it was believed that the most important sources of methyl alcohol in the United States would be covered by the agreement. The several State health officers were accordingly so notified.

In this agreement reliance is placed on a distinctive coloring, a chemical deterrent, and a warning label. The color selected was purple; the most important deterrent was chloroacetophenone (tear gas), which gives a very burning taste and under severe exposure—for example, close to the vent of a boiling radiator—would produce the tear-gas effect. For general industrial use of methanol reliance is placed on the same warning label as is used for antifreeze and on withholding new extensions of the use of methyl alcohol in industry until the conditions under which the substance can be safely used are scientifically investigated.

Industrial dermatoses.—An investigation of skin diseases of industrial workers was begun during the fiscal year, surveys being made in four candy factories in New York City, two silk-dyeing factories, a worsted mill handling dyes, a fur-dyeing plant, and an oil company. About 6,000 persons were examined for presence of dermatitis, and this group will be kept under observation for one full year. One hundred and ninety cases of dermatitis were found.

A discussion of a skin disease due to contact with Brazilian walnut wood was submitted for publication in the Public Health Reports.

An extensive bibliography on industrial skin affections was completed during the year.

Comparative air pollution of cities.—The most extensive investigation undertaken during the year relates to the determination of the comparative pollution of the air of 14 of the largest cities. During the year the plans were perfected, necessary personnel trained, instruments tested and calibrated, conferences held, and the field work commenced.

Loss of light due to smoke.—Records of daylight illumination at Baltimore to show the effect on illumination of the smoke in a downtown district have been completed and a report is being prepared.

Natural illumination in factories, schools, hospitals, etc.—During the year a report was prepared covering the results of measurements made at the experimental daylight building at Arlington, Va. Additional measurements for a more intensive study are being made at the present time.

Sickness among industrial employees.—For the tenth consecutive year reports of cases of sickness and nonindustrial accidents causing disability for more than one week have been received from a group of about 35 companies in which some form of sickness insurance requires a record of the cases occurring. Among about 140,000 men

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included in this sample of the industrial population a favorable health report was indicated all through the year 1930. During the first quarter of 1931 low sickness incidence rates were shown for the more important disease groups, with the exception of influenza, the rate for which was high on account of the widespread epidemic occurring in January and February, 1931. The pneumonia rate, however, failed to rise in proportion to the increase in influenza, indicating the relatively mild nature of the outbreak. The nonrespiratory disease rate in the past year has differed little from its incidence in the preceding year.

Survey of the work of employee mutual benefit associations.—The Office of Industrial Hygiene and Sanitation cooperated with the National Conference on Mutual Benefit Associations in a survey of the work of industrial sick-benefit associations with special reference to the extent to which such organizations have developed programs of health improvement and better medical care for their members. It was found that a large majority of the associations are essentially insurance organizations, making no attempt to control either the incidence or the duration of the disabilities afflicting their members.

Mortality in an industrial group.—The death rate among males in an industrial group under a highly organized plan for the care and prevention of sickness and accidents was compared with male mortality at the same ages in the State at large. During the 5-year period 1925–1929 the industrial group showed a decline from the 1913–1924 average that was approximately 14 per cent greater than the decrease in the rate among males at the same ages in the State at large.

Health of women in industry.—A study was outlined and begun in regard to health of women in industry, utilizing particularly the sickness records in the industries surveyed.

Studies of physical development and posture.—The final report of this investigation (IV. Postural Relations as Noted in 2,200 Boys and Men) was published during the year as Public Health Bulletin No. 199. Three photographs (profile, front, and back) were taken of each person nude, and these were supplemented by a complete physical examination. A large number of measurements of body angles were made on each of the photographs in order to yield quantitative indices of postural relations.

The most marked characteristic of the data obtained was the wide variation in postural relations from person to person. Equally great variability was found in the youngest children studied. No uniform type of "good" posture could be identified.

Physical impairment and occupational groups.—Two studies of physical impairments and occupation, involving 100,000 medical examinations, have been completed in cooperation with the Milbank Memorial Fund. The first study dealing with broad occupational classes was published in the Public Health Reports (August 22, 1930; Reprint 1404), and the second, dealing with 28 specific occupations, will be published early in the next fiscal year. A relation between physical impairment and occupational class, such as has been found in the past in official mortality data, was clearly brought out in these studies.

Rôle of physical examinations in research.—A paper in regard to the necessity for standardizing the technique of making physical

examinations was read before the Philadelphia County Medical Society and submitted for publication in the Public Health Reports.

Consecutive readings of pulse rate on a small group of clerks.—Daily observations were made in regard to the pulse rate of a group of clerks, 11 men and 11 women, over a period of months, the results of the study being published in the Public Health Reports (December 19, 1930; Reprint 1435). It was found that readings deviating as much as 10 to 15 beats per minute from the true average might occasionally be expected without having any particular significance.

Special surveys.—In the course of the year a number of special surveys were made, the results of which have not been analyzed for publication. Included among these was a survey of the industries in Kingsport, Tenn., to determine the presence of possible hazards with respect to tuberculosis; a survey of hazards in a large rubber company; a study of the ventilation of the Federal detention headquarters in New York; an investigation of atmospheric dustiness in a Maryland plant engaged in the grinding of quartz for abrasive purposes; and a study of the efficiency of ventilating devices in a granite-cutting plant in Massachusetts.

COOPERATION WITH THE BUREAU OF MINES

Surg. R. R. Sayers continued as chief of the health and safety branch, and as chief surgeon of the health division of the Bureau of Mines, being assisted by other officers detailed from the Public Health Service and by other personnel from the Bureau of Mines.

Health division.—Work of the health division included chemical and pathological studies of asphyxia by carbon monoxide and by atmospheres deficient in oxygen for the purpose of obtaining fundamental information on the response of the organism to asphyxial environment, and especially for developing the best method of treating moribund cases of carbon-monoxide poisoning. The first report of a series on this subject has been published.

Since 1926 studies have been made of chemical warning agents for fuel gases. Crotonaldehyde was found to be a promising warning agent of the nose and throat irritant type. Allyl alcohol on laboratory tests proved to be similar to or better than crotonaldehyde as a warning irritant. The most promising warning agent of the unpleasant-odor type was found to be ethyl mercaptan, but it does not waken sleeping persons unless present in high and impractical concentrations.

In cooperation with the safety division a study was made and a report submitted for publication showing the accident experience of coal miners in Utah, 1918 to 1929. Data have been compiled and a report is being prepared on the causes of death among coal miners, metal miners, and employees of metallurgical plants as compared with farmers and with "all other adult males."

Studies of the toxicity involved in the use of aniline and dimethyl aniline, benzol, dichloro-difluoro methane, carbon monoxide, and methanol were continued during the year.

Acrolein was found to be a suitable warning agent in the leakage of certain refrigerants. Work was carried on as usual in gas analysis, stream pollution, and gas masks.

MISCELLANEOUS ACTIVITIES

A new draft was prepared for a proposed sanitary code for industrial workers under the auspices of the American Standards Committee. This draft is under consideration at the present time.

Passed Asst. Surg. A. E. Russell represented the Public Health Service at an international conference on silicosis held at Johannesburg, South Africa, August 13-27, 1930.

An exhibit on the subject of silicosis and tuberculosis in industry was prepared and shown at the annual meeting of the American Medical Association in Philadelphia, June 8-12, 1931.

At the request of the State Department, a survey was made of the practicability of an investigation into the effect of sulphur-dioxide fumes from a smelter upon the health of persons living in the vicinity (Stevens County, Wash.).

A pamphlet was prepared for use of the National Safety Council on the methods and value of industrial health surveys.

COOPERATION WITH INDUSTRIAL AND OTHER AGENCIES

Members of the staff have represented the service on various technical committees engaged in the preparation of specifications and codes relating to industrial hygiene activities.

Cooperation with the Bureau of Standards.—An officer was attached to the Bureau of Standards during the year for the following purposes: (a) Cooperation in care of injuries and preparation of sickness reports; (b) studies of hazards in general (for instance, osmium poisoning); (c) study of applicability of methods worked out or on trial at the Bureau of Standards to public health problems; (d) as requested by the American Federation of Labor, a study of possible hazards to industrial workers of new processes and substances devised or tried by the Bureau of Standards for industry.

Cooperation with the Employees' Compensation Commission.—As in the past, an officer of the section is detailed to have charge of the medical work in the Employees' Compensation Commission. The officer in charge of the section serves as recorder of a board passing upon claims for compensation.

MILK INVESTIGATIONS

The activities of the Office of Milk Investigations were carried on under the direction of Sanitary Engineer Leslie C. Frank, with headquarters at Washington, D. C. The work has been along the following lines:

Committee work with the White House Conference on Child Health and Protection.—Approximately half of the time of the office and field staff of this office for the fiscal year was devoted to field and office work connected with the preparation of the Report of the Committee on Milk Production and Control of the White House Conference on Child Health and Protection. The preliminary report was published in the Public Health Reports (April 3, 1931; Reprint No. 1466), and gives the milk sanitation status of 430 American cities.

As a result of this committee report the White House conference recommended that laws or regulations for the supervision of milk supplies, whether local, State, or Federal, should incorporate, in so far as practical, uniform requirements at least the equivalent of those contained in a milk ordinance to be recommended by the United States Public Health Service and the Bureau of Dairy Industry of the United States Department of Agriculture. The White House conference further recommended that inasmuch as the laws and regulations relating to the public-health supervision of milk supplies deal only with measures which are designed primarily to protect the public health, they should, when practical, be made the function of health authorities, local, State, and Federal.

Cooperation with the United States Department of Agriculture.—During the year, in accordance with the recommendation of the White House Conference on Child Health and Protection, an agreement was reached with the United States Department of Agriculture under which that department approves the 1931 edition of the ordinance and code recommended by the Public Health Service. Such joint support of both the Public Health and the Agricultural authorities should be rapidly effective in establishing a nation-wide unification of milk control upon sound lines.

Publications.—During the year Associate Milk Specialist Franklin A. Clark, of the Public Health Service, and Mr. W. Scott Johnson, chief public health engineer of the Missouri State Board of Health, prepared a paper on the operation of the standard milk ordinance in Missouri (Public Health Reports, June 12, 1931, Reprint No. 1484). It may be summarized as follows: (a) There are 19 Missouri cities, having a population of 315,127, operating under the standard milk ordinance; (b) the sanitary quality of the retail raw milk has improved 54 per cent; (c) the sanitary quality of the raw milk delivered to pasteurization plants has improved 90 per cent; (d) the pasteurization plants themselves have improved 60 per cent; (e) there has been a material increase in the consumption of pasteurized milk (two cities now have over 50 per cent of their supply pasteurized and two others between 40 and 50 per cent; pasteurized milk sales have increased 108 per cent); (f) the consumption of market milk has increased 18 per cent; (g) the per capita consumption of milk in 17 of the 19 cities is 0.74 pints per day.

A paper entitled "The Public Health Control of Milk Supplies" was prepared by Sanitary Engineer L. C. Frank and submitted for publication in the Public Health Reports. It embodies answers to the following questions: (a) How frequent are outbreaks of milk-borne disease; (b) what type of milk ordinance should be adopted and enforced by the municipality or county in order to provide the maximum protection against such outbreaks; (c) how should the milk ordinance be enforced; (d) should the health officer recommend compulsory pasteurization or should he promote pasteurization by purely educational methods; (e) what record-keeping system should the health officer adopt; (f) how may the results of milk-ordinance enforcement be measured; (g) how may the health officer determine whether a given disease outbreak is milk borne; (h) what should be the function of the State health department with reference to the public health control of milk sup-

plies; (i) how may small communities and villages which are unable to provide their own full-time milk control staff secure an adequate public health control of milk supplies.

Extension of the adoption of the standard milk ordinance by American municipalities.—The number of American cities which have thus far adopted the standard milk ordinance recommended by the Public Health Service for the improvement of milk supplies has increased from 379 as of June, 1930, to 437 as of June, 1931. These cities are located in 24 States.

Research activities.—During the year Passed Asst. Sanitary Engineer F. J. Moss completed studies of devices and methods for the heating of the air and foam above the milk in pasteurization vats. These studies were considered particularly important in view of the fact that in the past most of the designs of pasteurization machinery have failed to render the milk foam nondangerous, but have nevertheless permitted the foam to be discharged into the milk-bottling system. Since foam is a poor conductor of heat, previous pasteurization devices have been unable to insure the killing of all pathogens within it. By the means of specially designed steaming connections in the upper part of each vat it has been possible to overcome this difficulty.

A study of the results of the enforcement of the standard milk ordinance in 152 municipalities located in 14 States has given the following information: (a) The raw-milk ratings of the 152 municipalities prior to the adoption of the standard milk ordinance averaged 64 per cent; (b) the raw-milk ratings of the same 152 municipalities after the enforcement of the standard milk ordinance averaged 91 per cent, the period of enforcement ranging from several months to 6 years; (c) the pasteurized-milk ratings of the 152 municipalities prior to the adoption of the standard milk ordinance averaged 62 per cent; (d) the pasteurized-milk ratings of the same 152 municipalities several months to 6 years after the enforcement of the standard milk ordinance averaged 87 per cent; (e) the per capita daily market milk consumption in the 152 municipalities increased from 0.48 to 0.58 pint, an increase of about 21 per cent; (f) the percentage of milk pasteurized increased from 33 per cent to 45 per cent. The actual gallonage of pasteurized milk sold per day has nearly doubled.

A study to determine the most effective and practical devices and methods for the bactericidal treatment of utensils and equipment at dairy farms and pasteurization plants was assigned to Sanitary Engineer A. W. Fuchs and Associate Milk Specialist M. M. Miller. It is considered important, because our knowledge of the efficiency of bactericidal treatment of utensils and equipment as now practiced at dairy farms and pasteurization plants is extremely unsatisfactory. An attempt will therefore be made to develop a laboratory criterion for proper bactericidal treatment and then, by means of this criterion, to determine the most effective means of securing adequate bactericidal treatment for each of the various types of devices used at pasteurization plants.

A study to determine the public health importance of milk cooling has been assigned to Associate Milk Specialist F. A. Clark, with headquarters at Austin, Tex. Special studies are being undertaken to show the effect of proper milk cooling, both at the plant and in the

home, in retarding the growth of the various types of pathogenic organisms transmissible through milk supplies.

A study to determine the proper design of milk-sample-shipping containers has also been assigned to Associate Milk Specialist F. A. Clark. Milk samples are shipped over longer distances in Texas than in any other State, and are exposed to as high temperatures as obtain in any State. The most advanced designs of milk-sample-shipping containers at present available, namely, those using frozen brine pads, have not proven entirely satisfactory for use during the hottest seasons. Special studies are therefore being undertaken with a view to designing a satisfactory shipping case for the use of the many health officers who are not provided with local laboratories, but must ship their milk samples to distant laboratories. Doctor Clark has been requested to study the possibility of using carbon-dioxide ice in a thermostatically controlled shipping container. Such a design should be light and effective over long distances.

A study of the public health value of chlorine disinfection of udders and hands in connection with the process of milking has been assigned to Milk Specialist W. H. Haskell, with headquarters at Portland, Oreg. The washing of hands and udders as usually carried out at dairies is considered quite unsatisfactory, and for this reason the present study is intended to determine whether a significant improvement can be effected by the use of chlorine solutions as recommended in the Standard Milk Control Code.

A study of laboratory methods for the estimation of milk quality from the public health point of view has been assigned to Assistant Milk Specialist R. C. Thomas, located at Montgomery, Ala. Special studies have been outlined by means of which it is hoped to determine the most satisfactory laboratory method for the measurement of initial contamination in milk, and also for the measurement of subsequent bacterial growth. All present day laboratory methods are being subjected to relative evaluation, including the bacterial plate count, the direct microscopic count, and the reductase test.

A survey of milk-borne disease outbreaks reported for the year 1930.—During the year 1930 the following outbreaks of milk-borne disease were reported to the Office of Milk Investigations by State and city health authorities: Typhoid fever, 27; septic sore throat, 9; scarlet fever, 2; miscellaneous, 6; total, 44.

STATISTICAL INVESTIGATIONS

The Office of Statistical Investigations continued under the direction of Senior Statistician Selwyn D. Collins, with Principal Statistician Edgar Sydenstricker acting as a consultant. The investigations include work carried on in the Office of Statistical Investigations independently as well as in collaboration with the other stations of the Division of Scientific Research and with other divisions of the service.

Study of the incidence and cost of illness.—By an arrangement with the Committee on the Costs of Medical Care, records of illness during a 12-month period in a group of about 10,000 families scattered throughout the United States have been made available to the Public Health Service as a cooperative study with that committee.

By this arrangement these data are being tabulated in this office, but clerical assistance is being furnished by the committee. The major part of the clerical work performed during this year has been on this study, because the schedules represent a very complete and detailed statement of the illnesses and the medical care received by the family during the year.

The nature of the data that will be made available in this study may be summarized as follows:

(1) Sickness records similar to the Hagerstown records, but for a group of families scattered throughout the United States, both urban and rural, and covering two or three times as many years of exposure as the Hagerstown study. These sickness records include (a) nature of and duration of each illness; (b) type of attendant, whether general practitioner, specialist, osteopath, chiropractor, or other practitioner; (c) kind of specialist in attendance upon case; (d) number of consultations or treatments for each type of practitioner; (e) kind of nurse and days or visits in attendance; (f) kind of laboratory or other special service, including X ray, received by the patient; (g) place of treatment of the case, as office, clinic, home, hospital; (h) kind of clinic or hospital, type of accommodations, and kind of special services received there; (i) extent of prenatal, natal, and postnatal care in maternity cases and by whom rendered.

(2) A complete record of surgery performed on members of these families during the year, including (a) the nature of the operation; (b) the diagnosis of the illness in connection with which the operation was performed; (c) whether the operation was performed by a general practitioner or a specialist and the nature of the specialty if a specialist did the work. (d) the place of the operation, as office, clinic, home, or hospital.

(3) A complete record of all preventive medicine, such as vaccinations, toxin antitoxin, antitetanus, antirabies, cold vaccine, physical examinations, etc., in this group of families, with a record of who did the work; that is, whether it was done by a private physician or public clinic.

(4) A record of all eye refractions.

(5) A record of all dental cases, together with the nature and extent of the work done.

For practically all these items there are now no data available on any sizable group of persons, and it should be remembered that each of the items that have been mentioned can be considered by age, sex, season of the year, and in connection with various other factors, including the income of the family, the occupation of the person, etc. It is planned during the next fiscal year to make a number of studies from these records, and it is believed that they will be of great value in the field of epidemiology and public health. Data on the cost of these various types of cases will be used by the Committee on the Costs of Medical Care. Of more interest to the Public Health Service are data on the number of physicians' calls on various types of cases and other measures of the extent of medical service rendered. In a few instances, however, such as surgical operations, the cost of the operation will be of some value in judging whether it was a major or a minor operation, particularly when cases are eliminated where the operation was said to be done at a reduced fee.

Field studies of morbidity.—The periodic canvassing of some 1,400 families in a rural area in Cattaraugus County, N. Y., and a like number of families in the city of Syracuse, N. Y., has been continued. One of the purposes of this study was to compare the incidence and severity of illness in the farm population with that in the industrial city population. It is expected to continue the Cattaraugus County study of illness through the fiscal year 1932, because very few data are available on the nature and severity of illness in rural areas. It is also expected to undertake certain special studies of epidemics that may occur in the rural area, with special reference to the spread from family to family in an area where interfamily contacts are much less frequent than in urban areas.

During the past fiscal year a paper was published on the Age Incidence of Communicable Diseases in a Rural Population (Public Health Reports, January 16, 1931; Reprint No. 1443). During the next fiscal year the tabulation of the data from both the rural and the urban areas, with further comparisons of the incidence of illness in the two places, will be continued.

Influenza studies.—The studies of influenza during the epidemic of 1928–29 were continued, but have not been a major part of the year's work. Two rather extensive papers have been published during the fiscal year and three are now in proof.

(1) Influenza Mortality in 50 Cities, 1910–1929. Public Health Reports, September 26, 1930; Reprint 1415.

(2) The Incidence of Influenza Among Persons of Different Economic Status During the Epidemic of 1918. Public Health Reports, January 23, 1931; Reprint 1444.

(3) Age and Sex Incidence of Sickness and Mortality from Influenza and Pneumonia During the Epidemic of 1928–29, with Comparative Data for the Epidemic of 1918–19 (in proof).

(4) Excess Mortality from Causes Other than Influenza and Pneumonia During Influenza Epidemics (in proof).

(5) Detailed Study of Influenza in About Twelve Surveyed Localities of 1918 (in proof).

A further paper on the details of the 1928–29 epidemic in each of about 14 surveyed localities is to be presented for publication in the near future.

Current mortality and disease prevalence statistics.—The collection and publication of monthly mortality statistics from such States as could furnish data to the Public Health Service was continued throughout the year, in cooperation with the Division of Sanitary Reports and Statistics. The present plan of publication of these current mortality rates is to publish about three summaries during the year, covering for the States with the most recent data available the periods January to March, January to June, and January to September, with an annual summary for the entire calendar year. Each summary includes not only data for the specified period of the current calendar year but comparative rates for corresponding periods in about four preceding years. The death rates are given by States and by cause. The purpose of these publications is to make available to the various State and city health officers mortality data from as many States as possible at as early a date as possible. When the work was originally started several years ago it was found by correspondence with the various State health departments that many States tabulated their deaths by months and could fur-

nish the data to the Public Health Service with little additional work. In some instances the State itself publishes a monthly or other current summary, but it was felt that the publication of the rates in the various States in a uniform manner and the circulation to health officers through the Public Health Reports would be a distinct advantage in keeping them informed of changes in current mortality.

Monthly summaries have also been published on the prevalence of disease in the United States. These summaries are based on weekly telegraphic reports received from the States.

In view of the undue prevalence of meningitis during the past three or four years a paper was prepared by Consultant A. W. Hedrich on the movements of that disease in the United States since 1915, with comparative data for various other countries.

Cooperation with other offices and divisions of the service.—A considerable part of the work of the Office of Statistical Investigations consists of rendering assistance to other offices and divisions of the service. This assistance comprises the following: (1) Technical advice and criticism on statistical procedure, (2) temporary assignment of statistical personnel to assist other units, and (3) use of mechanical tabulating equipment and of operators. Active cooperation in one or more of these respects has been continued throughout the year with the child hygiene and industrial hygiene offices and with the divisions of venereal diseases and mental hygiene.

STREAM POLLUTION

The administrative headquarters and specially equipped laboratories for stream-pollution studies located at Cincinnati, Ohio, have been continued under the direction of Sanitary Engineer J. K. Hoskins, assisted by a staff of experienced technical personnel.

In addition to the major divisions of research in progress during the year, special attention has been paid to the completion for publication of monographs on field investigations. At the end of the year the results of biological observations on the Illinois River had been published as Public Health Bulletin No. 198, and a bulletin describing the studies of the pollution of the upper Mississippi River was in press. The results of an epidemiological study of the relationship of typhoid-fever incidence to quality of the public water supply in six Ohio River cities were published in the Public Health Reports.

SURVEY OF THE PRESENT SANITARY CONDITION OF THE OHIO RIVER BETWEEN CINCINNATI, OHIO, AND LOUISVILLE, KY.

The Ohio River, because of its many characteristics representative of the larger streams of this country and of its heavy pollution load, was selected during the years 1914–1916 for intensive study of the fundamental principles of sewage disposal by dilution and of the natural process of stream purification as related to the problem of safe drinking-water supply. Since that time extensive changes have taken place, including complete canalization of the main channel during periods of low flow and normal increases in population and industry contributing polluting wastes. A resurvey of the section

of the river from above Cincinnati to the mouth of the Kentucky River was inaugurated in September, 1929, to measure quantitatively the effects on the stream of such changes, especially during critical periods of low flow. These observations were continued for a period of 16 months, ending with December, 1930. At the request of the Kentucky State Board of Health and the Louisville Sewerage Commission, and with their active cooperation, this study was extended downstream in May, 1930, to include the section from the mouth of the Kentucky River to a point about 5 miles below the Louisville metropolitan district. Observations in this latter section were concluded in May, 1931, thereby covering a period of 13 months.

The general scope of the resurvey has included the collection of nearly 2,000 water samples for chemical and bacteriological analyses at 10 main river sampling points and from 4 of the larger tributaries between Cincinnati and Louisville, and the collection and tabulation of the necessary hydrometric data and information relative to contributing population and sources of existing pollution. Data are therefore available for an 8-months' period representing conditions along the entire section, 165 miles in length, from above Cincinnati to below Louisville, and for over a year of conditions within and below the metropolitan areas of these two cities. Separation of the results into seasonal averages makes possible comparisons between open-river conditions at present with those of 15 years ago, open-river with pool-stage conditions at the present time, and present summer pool-stage conditions with open-river conditions in the summers of 1914 and 1916. In addition, an opportunity is presented to compare rates of bacterial disappearance, deoxygenation, and re-aeration at the present time with those observed previously under similar river conditions, and to study the changes in these rates with modifications in the controlling factors due to pool-stage conditions and greatly lengthened times of flow.

Preliminary analyses indicate that certain changes have occurred in the river since the previous investigation and suggest rather definite conclusions as to the effects of canalization during the summer period. Supplementary evidence from additional sampling stations during the present resurvey has supplied information tending to modify somewhat certain of the earlier conclusions relative to bacterial death rates and the oxygen relationships in polluted streams.

Among such indicated changes may be mentioned the concentration of purification processes in shorter stream lengths during pool stages which results in improved sanitary condition of the water at points distant from sources of pollution but which has the effect of intensifying dissolved oxygen depletion immediately below such major contributions of pollution. The oxygen requirement within the zones of pollution is likewise increased by the settled sludge deposited on the river bed as a result of slower velocities of flow through the pools. It also appears that points of maximum bacterial concentration are nearer to sources of pollution during pool stages, although the density of bacteria was found to be less at such times than during periods of unobstructed flow in the open channel. Another observation which confirms previous experimental evidence is that tributary inflow below a zone of sewage contamination ap-

pears to produce bacterial increases in the main stream below the point of dilution.

The field data collected during the course of the survey are now being studied critically in preparation for publication.

STUDIES OF THE EFFICIENCY OF ARTIFICIAL WATER PURIFICATION PROCESSES

Collective and experimental studies of the efficiency of artificial water purification processes, begun during the summer of 1924 and continued actively up to August, 1929, were brought to a definite conclusion during the past fiscal year with the publication in the Public Health Reports (July 4, 1930, and July 11, 1930, Reprint 1392, and December 19, 1930, Reprint 1434) of the fourth and fifth reports of a series dealing with the results of experimental studies and with the preparation of the sixth and final report of the same series for publication in the near future.

These studies originated in a preliminary series of observations of the Cincinnati and Louisville filtration plants and were later extended to include 17 additional plants, 10 of which serve Ohio River cities and 7 are located on various rivers of the Midwestern and Eastern States. Still later, a group of 14 municipal filtration plants taking their raw water supplies from the Great Lakes were included in the survey. A complementary study consisted of observations extending over a period of five years at a fully equipped large-scale experimental filtration plant of the rapid sand type constructed on the headquarters station grounds. During this entire period, under a cooperative arrangement with the operators of several municipal filtration plants along the Ohio River, monthly reports of daily operation results were furnished with a view to maintaining a continuous record of performance throughout the progress of the experiments.

It is now possible, as the result of these studies, to prescribe definite limits, in accepted bacteriological terms, for sources of raw water from which purified-water supplies in the Great Lakes and Mississippi River basins are derived. This is perhaps the most practical immediate result of the studies, though of scarcely secondary importance is the knowledge which they have afforded of the fundamental characteristics and limitations of water purification processes in general.

EXPERIMENTAL STUDIES OF NATURAL PURIFICATION IN POLLUTED WATER

Studies of the motivating biological factors in the natural purification process have been continued throughout the year. The nature and scope of this experimental work is clearly set forth in the article appearing in the Public Health Reports, February 20, 1931, discussing the rôle of the bacteria-eating plankton in the biochemical oxidation of organic matter, in which it is demonstrated that certain varieties of these microorganisms are essential to the sustained oxidizing activity of the bacteria. By themselves, however, the plankton appear not to be effective in the destruction of organic matter by oxidation.

Another paper on the selection of a standard dilution water for use in oxygen demand tests published in the Public Health Reports,

May 8, 1931, has shown that the nature and concentration of the mineral salts present in a water may be of minor importance in determining the rate and extent of biological purification, granting always that some such salts are present. The results of this study have a direct bearing on problems of self-purification in brackish or sea water and in waters heavily charged with industrial wastes of mineral origin. They are likewise related to the question, in sewage treatment, of the relative effect of hard or soft waters as carriers of pollution.

A third comprehensive report appearing in the Public Health Reports, May 29, 1931, dealt with the accurate determination of rates of purification in the presence of aerated or the so-called activated sludge, in which it is concluded that the high rate of oxidation is apparent only and is to be ascribed to adsorption or storage of organic matter in the sludge. In these studies use was made of a statistical procedure for the treatment of reaction-velocity data developed with the assistance of Consultant Lowell J. Reed and considered of sufficient interest to warrant separate publication in the Journal of Physical Chemistry (vol. 35, pp. 673-689, 950-971; 1930) for the use and information of workers in allied fields. Other publications have included a monogram for the calculation of dissolved oxygen, published as Supplement No. 95 to the Public Health Reports, and a set of detailed instructions for the determination of dissolved oxygen and of oxygen demand in polluted liquids, published as Supplement No. 90 to the Public Health Reports.

Other phases of this general study in progress at the end of the year deal with (a) the development of a suitable dilution water for use in the bacteriological laboratory, (b) the general course of oxidation in the nitrogenous stage, and (c) the specific relationship of algae to the oxidation process.

A correlative study of natural purification processes has been concerned with the changes occurring in a stream of polluted water flowing through a series of artificial channels where such factors as sunlight, velocity, depth, and degree of pollution may be modified at will.

MISCELLANEOUS ACTIVITIES

In addition to the publication of monographs on research studies, constructive service has been rendered by the personnel in a variety of ways, including conferences, investigations, and reports upon perplexing sanitary problems confronting States and municipalities; presentation of technical papers before national and sectional organizations interested in stream sanitation; service on technical committees of such organizations; and supplying instruction in procedures developed and employed by this station in stream examinations.

Studies of State and local sanitary problems.—During the year a rather comprehensive study was made of the present sanitary condition of the public water supply of Milwaukee, Wis., in response to requests of State and local officials. The report submitted advised the installation of additional safeguards in the form of filtration.

Biological growths in the body of water receiving the treated sewage of Baltimore, Md., have created objectionable conditions difficult to control. Assistance was rendered in planning and conducting experiments for the development of possible remedial measures.

Difficulties have been experienced with excessive growths of taste and odor producing organisms in certain lake waters of Iowa used for water supplies and recreational purposes. Following a survey of field conditions, advice was given the State and local authorities regarding advisable control procedures.

The State health authorities of Louisiana were advised regarding the methods for ascertaining the present sanitary condition of certain of the drainage channels serving the area in the vicinity of New Orleans.

Instruction in technical procedures.—For the third successive year a two weeks' course of instruction in the technique and interpretation of data of stream-pollution examinations has been presented to employees of State health departments at the request of the Conference of State Sanitary Engineers. This year one member from each of 18 States was in attendance. By this means the States are encouraged to undertake studies of their own problems in stream sanitation, employing the procedures that have been found to be most reliable for that purpose. Members of the staff have also assisted in short courses of instruction offered by various State health departments to sewage-plant and waterworks operators.

STUDIES OF PUBLIC HEALTH METHODS

The Office of Studies of Public Health Methods is an outgrowth of the Office of Administrative Health Practice, which was discontinued in December, 1929. Surg. Joseph W. Mountin was assigned to duty in charge of the studies of public health methods on February 1, 1931, and on June 10, 1931, Asst. Surg. J. O. Dean was assigned to assist him in this work.

Special surveys of the city health service in Wilkes-Barre, Pa., and Baltimore, Md., undertaken at request of State and local health officials, were in progress at the close of the fiscal year.

The original purpose of the Office of Administrative Health Practice, to give consultation service to local health officers, is to be continued, but greater stress is to be placed on scientific research in administrative practice. The facts revealed through investigations in the basic sciences need to be applied under controlled conditions before being incorporated into public health programs. Furthermore, a large part of the content of public health programs has been built on the collected experience and judgment of practical health administrators. Such programs need to be analyzed to determine the effectiveness of procedure as well as the economy of its application.

A special study is being projected for the coming year to determine the public health needs of people living under rural conditions, now these needs are being satisfied, and the extent to which the small county health department is capable of meeting the demands now being imposed on it. Upon the completion of this study, data will be available for the guidance of health authorities of other counties of similar circumstances.

The future program of the office also contemplates not only the study of specific measures in disease control and health promotion from the analytical point of view, but the conduct of experimental

work to develop and test new methods. Such measures should obviate the necessity of trial and error which results if various procedures are immediately incorporated into public health programs.

NATIONAL INSTITUTE OF HEALTH

The administration of the National Institute of Health for the fiscal year 1931 was continued under the supervision of Director George W. McCoy and Assistant Director R. E. Dyer.

Legislation.—Congress passed an appropriation bill of \$300,000 to begin work on new buildings for the institute and authorized the Secretary of the Treasury to enter into contract for such buildings not to exceed a total of \$750,000.

Publications.—Four laboratory bulletins were issued during the year and one was in proof. A considerable number of papers on scientific subjects were prepared by workers at the institute for presentation at professional meetings and for publication in various scientific journals and in the Public Health Reports.

Library.—Five hundred and twenty-seven volumes were added to the library, bringing the total number of volumes to 14,995. Annual reports from State and municipal health departments, as well as publications from various scientific institutions, were also added to the collections.

STUDIES OF NUTRITIONAL DISEASES

Nutritional studies at the institute were conducted under the direction of Passed Asst. Surg. W. H. Sebrell, with general supervision by Surg. G. A. Wheeler at Milledgeville, Ga.

The work consisted of testing individual foodstuffs in order to determine their probable pellagra-preventive value. This work was supplemented with studies on the antineuritic vitamin and feeding experiments with purified amino acids.

In collaboration with the Division of Chemistry, studies on the anemia-producing substance in onions were continued. Experiments were conducted with rats, which led to the development of an intra-peritoneal method for testing antineuritic concentrates, and several active concentrates were prepared.

A more detailed report of the nutrition studies, as carried on both at the National Institute of Health and at the Milledgeville State Hospital, will be found on pages 38-40.

DIVISION OF PATHOLOGY AND BACTERIOLOGY

Undulant fever.—Field investigations of undulant fever were continued under the direction of Senior Surg. H. E. Hasseltine.

Reports received through the various State departments of health show that 1,385 cases of undulant fever were reported officially, and also indicate that the reports in some States are far from complete.

In cooperation with the authorities of one State tuberculosis sanatorium, information has been gathered showing that a considerable part of the inmates give laboratory evidence of having, or having had *Brucella* infection in addition to tuberculosis. In a few instances undulant fever apparently has been the cause of sending patients to the sanatorium when they did not have tuberculosis.

One small outbreak of undulant fever was traced to the use of raw milk from a heavily infected dairy herd, *Brucella abortus* being isolated from the milk of some of the animals of this herd. The use of raw milk from this dairy was prohibited by the State department of health, but the sale of milk from this herd was permitted after pasteurization. No cases occurred after pasteurization was begun, indicating that the process of pasteurization is an efficient measure in the prevention of milk-borne undulant fever.

While most of the cases attributable to contact infection by persons engaged in some phase of the meat industry have been found in persons who work on pork and pork products, one case has been studied in which contact with hogs could not be traced. This man worked in a meat-packing plant, skinning the legs and heads of slaughtered beeves and sheep.

From studies made it appears that approximately half of the cases of undulant fever are traceable to the use of raw milk from infected animals and the other half due to contact with infected animals either on the farm, in the stockyards, or in packing establishments. In a considerable number of the cases in which infection was probably received through contact with infected animals there is also a history of the use of raw milk.

The prevention of milk-borne undulant fever can be accomplished by pasteurization of the milk, but the prevention of the contact-borne cases lies in the detection and elimination of *Brucella* infection from the livestock herds of the country. This is a gigantic task, that is essentially a problem for the veterinary profession and livestock sanitary authorities, and measures to solve it merit the whole-hearted support of all health authorities.

Laboratory studies made by Medical Director Edward Francis on the agglutinin absorption test have demonstrated that certain *Brucella* cultures, requiring carbon dioxide for their isolation, gave the *melitensis* A serological reaction of *Brucella melitensis*, thus showing that agglutinin absorption is not a reliable test for the differentiation of *Brucella abortus* of Bang from *Brucella melitensis* of Bruce.

Tularaemia.—Studies of tularaemia under Medical Director Edward Francis may be summarized as follows:

(1) The State of Delaware was added in December, 1930, to the area of distribution, leaving only four States in which the infection has not been recognized, namely, Maine, New Hampshire, Vermont, and Connecticut.

(2) During the calendar year 1930 the number of serums received at the National Institute of Health from 29 States and found positive for tularaemia was 159.

(3) Prevention of tularaemia in man calls for refrigeration of market rabbits at a temperature just above freezing for a period of time sufficient to allow the tularaemia infection to die before the rabbits are sold to the public. Complete experiments upon artificially infected rabbits refrigerated at 3° C. have demonstrated the isolation of the infection from practically all such rabbits after 1 month, from a smaller proportion after 2 and 3 months, from 6 rabbits after 4 months, from only 1 rabbit after 5 months, and from none after 6 months.

(4) Special Expert R. R. Parker at the field station at Hamilton, Mont., isolated *Bacterium tulareense* in May, 1930, from a snowshoe rabbit captured sick near Varenby, British Columbia. This is the first strain isolated from Canada, although McNabb in January, 1930, obtained the first agglutination of *Bacterium tulareense* from the blood serum of a Canadian, a resident of Timmons, Canada.

Researches on tularaemia conducted in the Rocky Mountain Spotted Fever Laboratory at Hamilton, Mont., are reported on page 44.

Typhus—Rocky Mountain spotted fever.—Studies upon endemic typhus of the United States have been conducted with increasing interest for a number of years. The investigations for the fiscal year just closed were continued under the direction of Surg. R. E. Dyer. Associated in the investigations were Passed Asst. Surgs. A. Rumreich and L. F. Badger. Toward the close of the fiscal year Asst. Surg. E. T. Ceder was added to the group.

The investigations for the past fiscal year have fallen under two headings, as it became apparent that two disease entities were concerned—typhus and Rocky Mountain spotted fever. An account of the work and its results appeared in the Public Health Reports for February 13 and 27 and June 12, 1931.

The suggestion that some vector other than the body louse may be responsible for the transmission of endemic typhus of the United States has been made by a number of investigators. In connection with epidemiological investigations of typhus it was found that 78 per cent of cases of endemic typhus occurred in persons who worked on rat-infested premises. Strains of endemic typhus virus were isolated from rat fleas removed from wild rats trapped on such premises, indicating that rat fleas serve as vectors of the disease.

It became evident very early in the course of field investigations of endemic typhus that many of the cases observed differed materially in clinical aspects from endemic typhus as described by Brill, Maxcy, and others.

It was noted that most of the cases living in rural districts in the northern tier of the States covered by the investigation and urban dwellers vacationing in the country suffered from a very severe disease, which did not correspond to the clinical picture of endemic typhus and which resembled the spotted fever of the Rocky Mountains more closely than it did any other disease. A quite high proportion of these cases gave a history of tick bite within a short time preceding onset. Furthermore, there was seldom evidence of rodent infestation in association with these cases.

In view of these facts analysis was made of 100 selected cases separated on the basis of epidemiologic considerations into two groups of equal size. The first group was essentially urban and consisted of persons who, in most instances, had not left city environment; these cases were clearly New World endemic typhus. The other group, composed of cases of known or presumed rural origin which followed tick bite or occurred under conditions which made tick bite possible, clinically resembled Rocky Mountain spotted fever. The onset, fever range, rash, physical findings, general symptoms, nervous and mental symptoms, laboratory findings, complications, and sequelae all indicated a disease entity separate from

endemic typhus. Moreover, there was no death in the endemic typhus group, whereas in 93 cases of the Rocky Mountain spotted fever type occurring in five States and the District of Columbia in the spring and summer of 1930 a mortality rate of 22.6 per cent resulted.

Immunologically in animals this disease is not distinguishable from Rocky Mountain spotted fever, but is distinct from European and endemic typhus (Brill's disease). However, certain variations have been noted in animals inoculated with the virus of the disease as it occurs in the Eastern States when compared with animals inoculated with a strain of Rocky Mountain spotted fever obtained from Montana. In general, the eastern type virus is apparently somewhat less virulent than the western type. Accordingly, attempts were made to transmit this type of the disease by the American dog tick (*Dermacentor variabilis*), inasmuch as this tick has a wide distribution in the eastern part of the United States and is the common tick in the areas where the eastern type of spotted fever has been found.

Female ticks (*Dermacentor variabilis*) were obtained from the field and allowed to deposit eggs. Larvae from these eggs were fed on guinea pigs infected with the eastern type of spotted fever and after engorgement on the infected guinea pigs were allowed to moult to nymphs. The nymphs were fed to engorgement on a noninfected guinea pig and then ground up and injected into fresh guinea pigs. This resulted in establishing a strain of virus in guinea pigs. In a second instance the nymphs transmitted the infection by feeding.

Ticks which, as larvae, had been fed on guinea pigs infected with the eastern type of spotted fever and had transmitted the infection as nymphs, were allowed to moult to adults. Being fed as adults, they transmitted the virus.

Results of cross-immunity tests between both the western and the eastern types of spotted fever and the virus recovered from the ticks justify the conclusion that the virus of the eastern type of Rocky Mountain spotted fever is preserved in the body of the American dog tick (*Dermacentor variabilis*) through at least two moults and that this tick is capable of transmitting the disease by its bite.

The eastern type of Rocky Mountain spotted fever has so far been found to exist in rural communities in Delaware, Pennsylvania, Maryland, the District of Columbia, Virginia, and North Carolina.

The laboratory investigation on the typhus-spotted fever group has been greatly hampered by the scarcity of healthy guinea pigs, and the consequent total loss of many experiments due to secondary infections.

Trachoma.—The laboratory investigation of trachoma was continued by Senior Bacteriologist Ida A. Bengtson, in conjunction with the trachoma-prevention work. Material for study was obtained from the trachoma hospitals at Rolla, Mo., and at Richmond, Ky., and also from cases in Decatur and Mitchell Counties, Ga., where field work was carried on by the medical officer in charge of the trachoma-prevention work. The results of the study of the Georgia cases proved of interest, in that the bacterial flora was found to differ rather definitely from that of the Missouri and Kentucky cases. During the winter months hemoglobinophilic organisms, streptococci, and pneumococci were much in evidence. In

a series of cases studied in May these organisms were found less frequently, but two varieties of Gram-negative small rod-shaped organisms were present in such numbers that they would appear to be of some significance in the disease. The methods used by Noguchi for the isolation of *Bacterium granulosis* were followed, using semi-solid *leptospira* media in tubes and horse-blood agar plates. In the *leptospira* media one of the cultures was present in approximately 75 per cent of the tubes and often in pure culture. Primary growth of the culture was not obtained on the horse-blood agar plates. Comparative cultural and serological tests show that neither of the cultures correspond with Noguchi's organism. Suggestive lesions have been obtained by inoculating *rhesus* monkeys, though sufficient time has not yet elapsed to determine whether the condition will become chronic. The Georgia disease resembles the trachoma of Missouri and Kentucky clinically, though it appears more amenable to treatment.

Disease of unknown etiology.—During July and August, 1930, a mild epidemic simulating food poisoning, and which had occurred for many years in various national parks, was studied by Surg. R. R. Spencer at the request of the National Park Service of the Interior Department. The symptoms and mode of spread of this affection have suggested that it has not been described hitherto and is a condition distinct from bacillary dysentery and food infections. The cause and source of the malady has not been ascertained, but further studies will be carried out when the opportunity presents itself.

Poliomyelitis.—Studies were carried out by Surg. W. T. Harrison on the antiviral properties of tissues of normal animals, and attempts were made, without success, to adapt the virus of poliomyelitis to the smaller laboratory animals.

Relapsing fever.—Studies on relapsing fever were made by Medical Director Edward Francis. Ticks of the species *Ornithodoros turicata* collected in Mills County, Tex., received in December, 1930, at the National Institute of Health, injected into white mice and white rats were found infected with the spirochete of relapsing fever, which organism had recently been found in the blood of human cases in Texas. Bedbugs artificially infected in the laboratory have been found to harbor the organism five months after their last infective feed. Ticks collected in caves in Mills County and San Saba County, Tex., were able to convey their infection, acquired in nature, to monkeys on which they fed in the laboratory.

Vaccination complications.—Studies by Surg. Charles Armstrong on postvaccination encephalitis have resulted in the collection of data for 62 proved or probable cases for the past 10 years, 11 of which occurred in 1928, 14 in 1929, and 21 in 1930.

Attempts to produce the complication by inoculating monkeys and rabbits with spinal fluid, blood, or excreta from four postvaccination encephalitis cases, followed by vaccination, uniformly failed.

Vaccine virus was recovered from the brain of one nonvaccinated rabbit inoculated intracerebrally with spinal fluid from one of four human cases tested. Four human spinal fluids were tested for "viricidal" antibodies, which were demonstrated in only one case. In this instance the fluid was tinged with blood.

Extensive attempts to produce postvaccination encephalitis in monkeys and rabbits by means of vaccine virus have uniformly failed to give the pathological picture of the disease. Guinea pigs were also tried, but spontaneous infections led to their abandonment in favor of the white rat, which was found to be susceptible to our heat-selected strain both by way of the skin or intracerebrally.

Postvaccination encephalitis is being studied along other lines, but results are not yet available.

Tests indicate that vaccinia does not render monkeys more susceptible to poliomyelitis than our nonvaccinated controls. It has been determined that vaccinia in rabbits does not decrease the amount of complement per volume of blood (rather is the complement found increased after vaccination), possibly owing to dehydration, since vaccinated animals often fail to eat their cabbage which supplies the water in their diet.

Nine cases of postvaccination tetanus were reported for 1930. Shields or dressings were used in seven of these, while in two, replies to inquiries were not secured.

An exhibit on postvaccinal tetanus at the American Medical Association received the award of a certificate of merit.

One hundred and thirty-three individuals were vaccinated as a means of virus control.

Pathology.—Work in the section of pathology has been carried on chiefly by Passed Asst. Surg. R. D. Lillie. The histologic diagnostic service to marine hospitals and other agencies has been continued; 1,621 specimens were received, of which number 1,563 have been examined and reports submitted. On account of the volume of other work it became necessary to suspend examination of routine autopsy material in February; 58 such cases have accumulated since that time. The amount of material received for diagnosis shows an increase of 493 specimens, or about 43 per cent over the preceding year. The increase is in part due to the addition of a new source of material, the United States penitentiaries, by reason of the act of May 13, 1930, placing prison medical relief under the jurisdiction of the Public Health Service.

In addition to this diagnostic work, histologic studies were made on partial or complete autopsies on experimental animals. These comprised material from typhus, eastern and western spotted fever, tularaemia, psittacosis, toxicology of amino-acid excesses in rats, of triorthoeresyl phosphate in various animals, experimental tumors, vaccinia, undulant fever, meningococcus meningitis, diphtheria toxin, syphilis, osmic-acid toxicology, and further studies on the histologic reaction in guinea pigs to a microorganism regarded by some workers as causally related to cancer.

A review of the pathologic histology of smallpox and vaccinia and National Institute of Health Bulletin No. 156 on experimental vaccinia in rabbits have been published. A study on melanosis of the appendix and a report of a case of mast cell leucemia in a cat are now in press. Reviews and further studies in human and experimental tularaemia and psittacosis are in preparation.

There follows a tabulation of the specimens received in the Division of Pathology and Bacteriology during the fiscal year.

A. Tissue specimens of human origin:	
Hospitals and relief stations of the Public Health Service-----	1,420
United States penitentiaries-----	95
Other Federal agencies-----	27
Field investigations of the Public Health Service-----	26
In cooperation with State health agencies-----	25
Miscellaneous-----	28
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Total human-----	1,621
B. Pathology of experimental diseases-----	
	592
<hr/>	
Total-----	2,213
Specimens prepared for other divisions but not examined in section on pathology-----	26
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Total specimens prepared for histologic examination-----	2,239
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C. Routine examinations and tests:	
Wassermann tests (blood and spinal fluid)-----	12,147
Blood—	
Count-----	20
Tularaemia-----	521
Undulant fever-----	695
Typhus fever-----	1,176
Typhoid fever, para A and para B-----	177
Urinalyses-----	36
Cultures—	
Diphtheria-----	78
Miscellaneous-----	53
Sputum-----	5
Brain for rabies, animal-----	9
Miscellaneous-----	17
Feces-----	4
Water-----	74
<hr/>	
Total-----	15,012

Serology.—Surg. R. R. Spencer has attempted the cultivation of the virus of Rocky Mountain spotted fever and smallpox by a method of gradual adaptation to various culture media and to susceptible animals. No suggestive results were obtained.

The chemical decomposition products and enzymes in the filtrates of cultures of about 100 nonpathogenic bacteria and molds have been studied for their viricidal effect upon the virus of Rocky Mountain spotted fever and typhus fever. It was hoped that some of the bacterial products would be antagonistic to the development of the virus when mixtures were injected into susceptible animals. So far no positive results have been noted.

By following the technique of Hadley for obtaining filtrable forms of the *B. dysenteriae*, filtrable forms of *B. proteus* X₁₉ (the organism used in the serodiagnosis of typhus and Rocky Mountain spotted fever) have been obtained. These filtrable strains derived from *B. proteus* X₁₉ have not proven to be pathogenic for animals, nor do they bear any relation to the virus of typhus and Rocky Mountain spotted fever.

Studies of streptococci.—A study of the effect of hemolytic streptococci and their products on leucocytes was made by Senior Bacteriologist Alice C. Evans. It was established that a toxic substance which disintegrates the leucocytes is produced by the action of hemolytic streptococci on red blood cells. This leucocidic substance is distinct from the skin toxin and it is distinct from hemolysin.

Studies on streptococcus bacteriophage are in progress, with particular reference to (a) the relationship between hemolytic streptococci from scarlet fever, erysipelas, and puerperal fever as revealed by their susceptibility to a certain strain of bacteriophage; and (b) the nature of bacteriophage.

New organism.—A new organism, designated *Alcaligenes faecalis* subspecies *radicans*, was described by Senior Bacteriologist Alice C. Evans. It was obtained by blood culture from a mild case of enteric disease which at first resembled typhoid fever.

STUDIES OF BIOLOGIC PRODUCTS, INCLUDING THE ARSPHENAMINES

Scarlet fever.—Studies on problems related to the use of biologic products for the prevention and treatment of scarlet fever have been continued by Surg. M. V. Veldee. The production of scarlet-fever toxoid has been shown to be possible, and clinical data indicate that toxin so modified by heat and formalin retains its antigenic properties.

A clinical study of the therapeutic effects of various commercial antitoxins has been conducted in a mid-western city. This work has not been completed.

The search for a laboratory animal method for standardizing scarlet-fever biologics has been continued. Toward the end of the fiscal year results developed that are at least very encouraging for the future. Animal reactions were obtained which correspond very favorably with similar reactions in susceptible human beings. The work is being continued.

Diphtheria prophylactics.—Studies were continued by Surg. W. T. Harrison on the effect of low temperatures on 0.1 L+ dose toxin-antitoxin mixtures. Mixtures preserved with the newer mercurial compounds do not show any appreciable change on freezing, and it was therefore recommended to manufacturers that one of these compounds be substituted for the phenoloid preservatives.

Meningitis.—These studies were continued by Senior Bacteriologist Sara E. Branham. Many new strains of meningococci were received, chiefly from outbreaks in Eastern States. A total of 320 strains were studied intensively. The serological classification of these strains and the relation of the groups to each other and to the original type strains of Gordon were given special attention. A report was published discussing this phase of the work. Ninety-five per cent of these strains could be placed in Gordon's four groups, but Groups I and III, as found in these epidemics, were so closely related to each other and their separation was so laborious that the practical value of placing these strains into two groups has seemed doubtful. Groups I and III have been predominant, together comprising 82 per cent of the entire number of strains received.

The cultural and fermentation reactions of all these strains and the relation of temperature and medium to growth and viability have been studied as a basis for further investigations. All strains of meningococci have been found to ferment dextrose and maltose. Temperature and medium have a marked influence upon the viability of all meningococci, but individual strains vary much in this respect.

A study of different methods of evaluating therapeutic serum has been recently undertaken and is now in progress. It is hoped that

comparison of these methods will aid in determining the therapeutic value of antimeningococcic serum.

Gas gangrene antitoxin.—An increased interest having become manifest in gas gangrene antitoxin and in response to requests from the manufacturers of biological products for standards to be used in testing the potency of their products, work looking toward the establishment of standards for all the antitoxins contained in the gas gangrene antitoxin has been begun by Senior Bacteriologist Ida A. Bengtson. The unit for measuring the potency of perfringens (*C. welchii*) antitoxin was revised, the present unit being one one-hundredth that of the former unit. A supply of perfringens toxin was prepared in a sufficient amount so that it may be furnished to the manufacturers for testing purposes, as has hitherto been done in the case of tetanus toxin.

Arsphenamines.—Studies by Assistant Pharmacologist T. F. Proby on the activity of neoarsphenamine in experimental syphilis in rabbits have been continued. The reported lack of agreement between the spirocheticidal activity in rabbits and the trypanocidal activity in rats seems to be further indicated. Neoarsphenamines varying in their trypanocidal activity are apparently parallel in protecting rabbits from the development of the disease by one prophylactic dose and in curing the animals of the disease by one sterilizing dose. The routine examination of the arsphenamine preparations has continued to indicate the excellent quality of commercial arsenicals.

DIVISION OF ZOOLOGY

The following work has been pursued by the Division of Zoology, under the direction of Medical Director C. W. Stiles.

International Commission on Zoological Nomenclature.—Cooperation with the International Commission on Zoological Nomenclature has continued as in preceding years. Various questions on nomenclature and terminology have been submitted to the division for advice or decision by a number of governmental departments and universities in the United States and abroad.

Bulletins.—National Institute of Health Bulletin 155, on the parasitic diseases of bats, in relation to the diseases of man, has been issued from the press.

National Institute of Health Bulletin 159, on the parasitic diseases of insectivores in relation to the diseases of man, is in press.

An additional bulletin on the parasitic diseases of carnivores in relation to the diseases of man is practically finished and will be forwarded for publication in the immediate future.

Examination of intestinal parasites for diagnosis.—This part of the routine work of the division has been continued throughout the year, and 303 specimens have been examined for various Government hospitals, State health departments, universities, and for practicing physicians.

Survey of hookworm disease.—A survey of 98 white schools in the sand-land districts of the Southern States was made for clinical evidence of hookworm disease. Of 18,649 children recorded it was estimated that at least 20 per cent showed clinical hookworm disease.

There appeared to be a definite correlation between hookworm disease and retardation of the pupils.

As a result of the survey a plan for the modification of hookworm control work as applied to the schools was discussed with a number of State, county, and city health officers, State and county superintendents of education, and principals and teachers in the schools.

DIVISION OF PHARMACOLOGY

The following work was pursued by the Division of Pharmacology under the direction of Pharmacologist Director Carl Voegtlin.

Chemistry of cell division.—An outstanding characteristic of cancer cells is their unrestrained proliferation in the human and animal body. It is therefore of fundamental importance to ascertain the chemical factors which either favor or inhibit cell division. In the 1930 annual report attention was called to the lack of information relating to this subject. The results of a preliminary study of cell division in *Amoeba proteus* under carefully controlled conditions had shown that glutathione, a sulphur containing polypeptide occurring in both normal and malignant animal cells, exerts a stimulating action on cell division. During the present fiscal year these studies have been continued. The following results were obtained:

(1) Under normal conditions the process of cell division depends on the cell volume.

(2) Exposure of amoebae to relatively low concentrations of glutathione (reduced and oxidized form) results in more nuclear and cell divisions and more polynucleate cells than in the controls.

(3) Glutathione apparently has a specific action on the cell nucleus. It favors nuclear growth, maturation, and division, this being accompanied, under the experimental conditions employed, by a marked decrease in cytoplasmic volume.

(4) Exposure of amoebae to extremely dilute copper salt solutions (m/500 million) inhibits cell division. This action of copper is accompanied by a marked reduction in nuclear growth and is apparently a reversible effect, as transfer of these cells to a normal cultural environment is followed by growth. This observation is of interest in view of the wide distribution of copper in all living cells, and therefore is a contribution to the biological significance of copper. This phase of the work forms part of a systematic study of the influence on cell division of the heavy metals which are normal cellular constituents.

During the progress of this work it became evident that further information on the relations between cell growth and cell division under cultural conditions was very desirable for the progress of the chemical studies. A comprehensive research dealing with the growth rate of the cytoplasm and nucleus, the nucleocytoplasmic ratio, and the relation of these factors to the cell-division process under normal cultural conditions was completed.

Oxidation catalysis of glutathione.—Previous work of the division has shown that glutathione apparently plays an important function in cellular metabolism, and its effect on cell division emphasized the need of further chemical and biochemical knowledge of this substance. As previously stated, glutathione can exist in a reduced and oxidized form. A systematic investigation of the oxidation of

glutathione was completed. The principal results obtained indicate that of a large number of metal compounds studied, copper is by far the most effective oxidation catalyst of crystalline glutathione. The so-called autoxidation of glutathione in reality is due to the minute amounts of copper present in the crystalline substance. It was possible by special methods to remove practically all copper from crystalline glutathione and thus to decrease to a negligible degree the rate of oxygen consumption of its solutions in buffers of physiological pH. It is believed that these and other results of this work have a broad physiological significance and may have some bearing upon the action of glutathione and copper on cell division.

Tissue cultures.—In previous work on this subject the great need for better control of the chemical constancy of the culture medium became apparent. Observations have shown that with the existing methods a marked alkaline drift of the culture medium occurs soon after the cultures are set up. This is followed under certain conditions by a drift toward the acid side. A technique has therefore been developed which permits control of and largely eliminates these drifts in hydrogen-ion concentration. Using this technique, a systematic research was carried out on the influence of variations in pH of the culture medium on the growth of fragments of embryonic chick heart. Further attempts have been made to obtain cultures from single cells, but so far without success.

The Jensen rat sarcoma has been kept continuously in cultures for several months. Chemical studies on these cultures have been initiated toward the end of the year.

Hydrogen-ion concentration of tumors.—Work was continued on the development of a microelectrode suitable for the measurement of the hydrogen-ion concentration of tumors and normal tissues in living animals. Practically all knowledge of pH measurements under physiological and pathological conditions relates to the blood and other body fluids. Nothing is known concerning the important pH of living tissues. This is due to the absence of reliable and suitable electrodes. A purely physicochemical research on the glass electrode was completed. It was found that with proper construction relatively thick walled soft-glass tubing will permit the measurement of the pH of solutions, and clues were obtained as to improvements in the construction of microelectrodes of the capillary type. During the latter part of the year Pharmacologist Director Voegtlin and Senior Biophysicist Kahler have tested the reliability of the microelectrode and found it very satisfactory. Preliminary observations also indicate that the true pH of tumors in the living animal can be measured. Such measurements compared with measurements on normal tissues and benign tumors are of considerable importance for deciding the question as to whether or not the infiltrating properties of malignant tumors are due to excessive formation of lactic acid. They are also of value in work on cultures of malignant and normal tissues.

Glutathione content of tumors.—During the latter part of the year a reinvestigation was begun of the glutathione content of malignant and benign transplantable tumors by means of improved analytical methods. The results confirmed and extended previous findings in this laboratory, showing that malignant tumors contain a relatively

high concentration of glutathione in the reduced form and no detectable free cystine or cysteine. These results are of interest in connection with the discovery of the stimulating action of glutathione on cell division.

Chemotherapy of tumors.—During the latter half of the year a systematic investigation was initiated of the possible therapeutic value of heavy metals which are known to occur normally in tissues. In view of the preceding observations referring to the action of copper on cell division and the oxidation of glutathione, compounds of this metal were made, tested as to their toxicity in rats and as to their therapeutic action on two strains of transplantable rat tumors, propagated in two inbred strains of rats fed on a diet of constant composition. It is too early to reach any definite conclusions.

Ginger paralysis.—In collaboration with the Division of Chemistry, and chemists of the Prohibition Bureau, two reports were published on the etiology of the epidemic of ginger paralysis which occurred early in 1930. The results left no doubt that these cases of paralysis were due to the consumption of Jamaica-ginger extract, adulterated by the addition of about 2 per cent triorthocresyl phosphate. This conclusion was reached on the basis of sufficient epidemiological, pharmacological and chemical evidence, all indicating that previous to the time of the occurrence of the epidemic this adulterated ginger had been distributed over wide areas of the country and had been consumed by thousands of people. Probably as a result of the wide publicity given to this epidemic in the daily press most of the adulterated ginger was withdrawn from the open market and no new cases developed in the following summer and fall. Another epidemic of minor proportions (about 125 cases) occurred early in 1931 in Los Angeles and neighborhood. A careful investigation of this epidemic also showed that it was caused by ginger extract adulterated with triorthocresyl phosphate. It was possible to reproduce the disease in animals by feeding them this adulterated product, or triorthocresyl phosphate alone. Genuine U. S. P. extract of ginger gave negative results.

Principal Pharmacologist Smith, in collaboration with Passed Assistant Surgeon Lillie, completed a research dealing with the histopathology of triorthocresyl phosphate poisoning in man and experimental animals. The results indicate that this multiple neuritis is essentially a myelin sheath degeneration of the peripheral nerves, with a variable amount of relatively moderate central degenerative changes affecting the anterior horn cells throughout the spinal cord, particularly those in the lumbar and cervical regions.

Further studies were made on the toxic action of other esters of phenolic compounds as compared with that produced by triorthocresyl phosphate. So far the latter substance is the only compound of this group producing motor paralysis. This poison is retained by the body over a remarkably long time and exerts a cumulative injurious action.

Attempts have been made to develop a treatment, but so far without avail.

Chemotherapeutic action of arsenicals.—During the year the work on this subject was continued, particular attention being paid to the

mechanism of the action of arsenic on protoplasm. It was found that the marked reduction in the rate of oxygen consumption of living tissues *in vitro*, caused by exposure of the tissues to arsenious oxides, can be prevented by the addition of an adequate amount of SH glutathione. This substance in the disulphide form is inactive. These results are therefore in harmony with previous reports of the division, showing that SH glutathione prevents the toxic and chemotherapeutic action of these arsenicals. Further observations were made on the action of glutathione, iron compounds, cyanide, etc., on the fundamental process of tissue respiration. Research was completed on the relation of arsenic to the fixed sulphhydryl groups of proteins. It had been suggested in previous papers from the division that, besides glutathione, other physiological sulphhydryl compounds, as proteins, may be concerned in the chemical interaction of arsenic with living cells. The present work furnished conclusive proof with regard to proteins containing SH groups. Proteins without this grouping do not combine with arsenious oxides. This evidence is of interest also as a contribution to the subject of the physiological and pharmacological function of proteins.

Ergot standardization.—The conditions under which deterioration of the official extract of ergot occurs were studied, and partially successful attempts were made to prevent this deterioration during storage by the addition of certain reducing substances.

Effect of fat ingestion on liver.—With the cooperation of Passed Assistant Surgeon Lillie, a research was completed on dogs, on the effect of ingestion of a diet rich in fat. This diet causes a slight impairment of liver function as determined by the bromsulphthalein test. If the liver has previously been damaged by chloroform or carbon tetrachloride, lipemia produces a greater impairment of liver function. The functional change was studied in relation to the histological liver picture.

Miscellaneous.—The chief of the division is a member of the committee on drug addiction of the National Research Council. This committee is engaged in directing a comprehensive chemical and pharmacological investigation for the discovery of non-habit-forming substitutes for the opium alkaloids.

Principal Pharmacologist Smith is collaborating with the revision committee of the United States Pharmacopœia in the development of suitable standards and methods for fluid extract of ergot and pituitary extract.

DIVISION OF CHEMISTRY

The work of the Division of Chemistry was continued under the direction of Prof. Claude S. Hudson.

Sugar researches.—These researches are of a fundamental character. While the primary purpose is to further perfect the systematization of the relations between rotatory power and structure in the sugar group, a number of new sugar compounds have been discovered in connection with these researches. The studies of these new compounds, which are of importance in the field of sugar chemistry, which, in turn, is of importance in many problems of health and disease, may also help, as similar studies have helped in the past, to increase our knowledge concerning chemical constitution in

organic chemistry in general. In addition to the discovery of new compounds, these researches provide opportunity for improving the methods of preparation and the yields of sugar derivatives previously discovered, as well as the obtaining in pure crystalline state of such derivatives which heretofore could be obtained only as sirups.

An improved method was worked out for the complete determination of the configuration of the most important sugars. Improvements were also developed in the methods for the preparation of tetracetyl- β -methyl d-mannoside, lactose carboxylic acid, α -methyl mannoside, and dibenzylidene α -methyl mannoside. Suitable procedures were devised for the comparatively large-scale preparation of perseitol, d-mannoheptose, α -d-mannoheptonic lactone, and the barium salts of alpha- and beta-mannoheptonic acid. Experiments on the course of fermentation of hydrolyzed lactose solutions with yeasts demonstrated the possibility of utilizing such fermentations for obtaining galactose, in good yields, from lactose.

The results of the studies of the several new derivatives of rhamnohexose show that the rules of isorotation hold in this series and throw light on the structure of the sugars possessing a similar configuration. The methylation of pure β -triacetyl 1-rhamnose with silver oxide and methyl iodide yielded a mixture of the known alpha- and beta-methyl rhamnoside triacetates, thus showing that beta-triacetyl rhamnose does not possess the ortho-ester structure proposed by Freudenberg and Haworth for triacetyl-gamma-methyl rhamnoside. The data obtained in connection with the study of the new β -methyl d-mannoside show that it possesses the 1.5 ring structure.

Sulphur metabolism.—Further applications of the Sullivan reaction for cysteine were made. It was demonstrated that by means of the Sullivan colorimetric method cysteine can be estimated quantitatively in any proportion of glutathione, at least up to 100 glutathione to 1 of cystine. The cystine content of 23 purified proteins was determined by estimating the cystine in their hydrolysates. Likewise, the cystine content of round steak, sirloin steak, haddock, halibut, and salmon was determined, using both the fresh material and tissue powders dehydrated and defatted by acetone and ether.

Studies were made on the rate of absorption of cystine, fed as the sodium salt, from the gastrointestinal tract of the rat. The Sullivan and Okuda methods were found to give closely agreeing results. The value found by these methods was, in round numbers, 50 milligrams of cystine per 100 grams of body weight per hour—a value which puts cystine in the same class as other amino acids as far as absorption is concerned.

Experiments were also carried out in which dithioethylamine (cystine amine) was substituted for cystine in the diet of the white rat. The results show that both cystine and cystine amine gave increased growth of the rats over that given by the basal diet and that the cystine amine can replace cystine to a considerable degree for the purpose of growth of the young white rat.

Analytical work.—About 258 various analyses of miscellaneous material were carried out. In addition, there were examined about 64 arsenicals, and several toxicological examinations were made on body fluids, food, and miscellaneous material. In connection with

this work there was a continuation of the cooperation extended to the work on the relation of diet to pellagra. Analyses were carried out of the salts used, the required standard acids were prepared, and chemical examinations were made of some of the foodstuffs used.

Cooperative work.—The cooperative work of this division in the studies of the relation of diet to pellagra, which have for their aim the preparation of active concentrates of the P-P factor, was continued. Standard buffer solutions were prepared for use by various workers.

Miscellaneous.—Expert chemical advice and assistance were given by the various members of this division to workers in allied fields, and memoranda on a variety of subjects were prepared.

SERUMS, VACCINES, AND ANALOGOUS PRODUCTS

Government control of the manufacture and interstate sale of biological products in conformity with the law of July 1, 1902, continued under the supervision of the director of the National Institute of Health. At the close of the fiscal year, 38 licenses were held by domestic manufacturers and 12 by foreign producers. These licenses cover 137 different preparations. As usual, all establishments in the United States were personally inspected and an officer was detailed abroad for foreign inspections. An account of the investigations concerning these products will be found on pages 72-73.

The following is a summary of the routine tests carried on at the institute during the year in the control of biologic products:

Serums, vaccines, toxins, etc.:	
Tested for sterility-----	1,851
Tested for potency-----	665
	2,516
Arsphenamines:	
Tested for toxicity-----	228
Tested for solubility and stability-----	515
	743
Total-----	3,259

MISCELLANEOUS

By the act of April 9, 1930, the name of the Advisory Board of the Hygienic Laboratory was changed to the National Advisory Health Council, five additional members were authorized, and the functions of the council were broadened. The first meeting of the new council was held on April 9 and 10, 1931, and the work of the Public Health Service was reviewed. While suggestions were offered for additional lines of endeavor, the council as a whole felt that the work now being carried on was of inestimable value in the field of public health and should be continued without material change.

During the fiscal year there have been 3 Public Health Bulletins, 4 National Institute of Health Bulletins, and 157 scientific articles for the Public Health Reports or for outside publication submitted through this division for review and recommendation as to publication.

DIVISION OF DOMESTIC (INTERSTATE) QUARANTINE

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

PLAGUE-SUPPRESSIVE MEASURES IN CALIFORNIA

The continued existence of foci of rodent plague in California required that plague-suppressive measures be carried on in cooperation with State and local authorities as in previous years. The plan of work was essentially the same as that followed in 1930, with the combined activities of the cooperating agencies falling into the following divisions: (a) Plague in ground squirrels and control measures directed against these rodents, (b) rodent surveys and sanitary inspections in San Francisco, and (c) work performed in the United States Public Health Service laboratory.

No human case of plague has been reported during the year.

PLAGUE IN GROUND SQUIRRELS

Control measures directed against ground-squirrel infestation in California are being carried on by horticultural commissioners in the several counties for economic reasons, although attention is paid to the eradication of these rodents from a public health standpoint. In the event that a survey determines existence of foci of plague infection in a county, State aid is secured in the eradication of ground squirrels, particularly around such foci, as a public health measure. The work carried out by these county officials operating with county funds, and in certain instances with funds from the State, has been more intensive during the past three years, and tangible results are being accomplished.

The work of the Public Health Service consists in operations in four counties around San Francisco Bay for the purpose of eradication of rodents around centers of population, particularly the East Bay cities. All of the work in San Mateo and San Francisco Counties is conducted by the Public Health Service employees. In the counties of Alameda and Contra Costa the operations are carried out conjointly with the horticultural commissioners. This work has been prosecuted in accordance with a definite program, and marked improvement has been effected. Limited shooting operations were carried out against ground squirrels at Sunnyvale, Santa Clara County, Calif., the site selected for the dirigible base, and in a portion of San Francisco County. This work was done in order to determine whether any infection existed among the ground squirrels in these specific localities. No infection was found.

Limited shooting operations also were carried out by the State board of health during the fiscal year for the purpose of determining foci of infection in ground squirrels, and two foci of the disease were demonstrated in Monterey County. It is considered likely that plague infection still exists in other counties, particularly in remote districts where intensive squirrel control measures have not been carried out. If extensive shooting operations were permissible to obtain

an adequate sample of the squirrel population, it is not improbable that foci of plague infection still would be demonstrated in most of the counties in which it was originally determined.

Although the eradication and control of ground squirrels has been more extensively practiced during the past three years, this work must remain continuous in order to insure satisfactory results, particularly in counties where plague infection has been recently demonstrated, in order to prevent the spread of the disease among these rodents and also to prevent reinfestation of areas in which they have been destroyed by intensive operations. In some areas the work has not yet reached a stage sufficient to insure the eradication of ground squirrels, particularly on grazing lands, where the infestation is most pronounced.

Field operations carried out by the Public Health Service are tabulated as follows:

Number of inspections.....	1, 205
Number of reinspections.....	3, 959
Number of acres inspected.....	249, 805
Number of acres reinspected.....	1, 017, 332
Number of acres treated with waste balls.....	28, 601
Number of acres treated with poison grain.....	218, 775
Number of burrows treated with carbon bisulphide.....	120, 535
Number of burrows treated with grain and paper.....	6, 670
Number of acres treated with calcium cyanide.....	50

Material used

Number of gallons of carbon bisulphide.....	2, 049
Number of waste balls.....	120, 535
Number of pounds of calcium cyanide.....	5
Number of pounds of poisoned grain:	
Strychnine.....	23, 544
Thallium.....	41, 003
Phosphorus.....	6, 684
	71, 231

Poisoned barley mixed for private landowners under the supervision of employees of the Public Health Service; number of pounds, strychnine.....	195
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MEASURES TAKEN AGAINST RATS

The operations against these rodents consist of (a) trapping and examination of rats, (b) inspection of premises where rat infestation is reported, and (c) inspection and report on buildings that are insanitary and constitute rat harborages to the extent that they have become a menace to public health. This program has been continuous for several years and has been confined to San Francisco, with the exception of the examination of rats trapped in Oakland and examined in the Public Health Service laboratory. A sufficient number of rats are caught and examined in order to furnish reliable information as to whether plague infection has gained an entrance.

Rat survey in San Francisco.—Trapping operations are carried out by 6 employees—2 Federal and 4 city. These operations are in districts where the heaviest infestation exists and where, if plague infection should gain entrance, it most likely would be encountered. Therefore, trapping has been centered in the slaughterhouse district, in business sections, and particularly around markets and food stores. The residential section has received less attention because there is less potential danger in such districts, although all reports of rat

infestation made to the office are investigated, and trapping is carried out in apartment houses and other structures when evidence of infestation exists.

The rats are examined in the Public Health Service laboratory in San Francisco. While the number of trappers does not permit of eradivative measures and are employed mainly at strategic points for survey purposes, the operations furnish a reliable index of pathological conditions existing among these rodents, and even these limited measures would furnish prompt knowledge of a focus of plague infection, thereby permitting intensive operations by the city health department before any spread probably would occur. The advantages of such a survey far outweigh the cost, which is small in comparison with the possibility of securing definite knowledge as to whether infection is present.

Rat survey in Oakland.—The rats caught by two trappers employed by the Oakland Health Department have been examined in the laboratory of the Public Health Service in San Francisco, but the number of rats caught is too small to furnish any index as to whether infection exists. More trappers should be employed in this work, particularly in districts where the rat infestation is large. The importance of an adequate survey in this city can be emphasized on account of bubonic plague having occurred in Oakland as late as 1924.

Sanitary inspections in San Francisco.—This work, as related to plague-suppressive measures, is performed by one inspector in cooperation with the health department of the city of San Francisco. Inspections are made of insanitary premises upon which rat infestation has been reported. A trapper is often sent to such places and advice is given relative to corrective measures to prevent reinfestation of the premises.

Another phase of this activity which is of major importance as it relates to permanent improvement is the inspection of old, insanitary buildings which furnish rat harborages. Reports are made to the city health officer and definite recommendations are made as to correction.

Following is a tabulation of inspection activities:

Rat complaints investigated.....	927
Insanitary premises inspected.....	184
Number of buildings submitted to board of health for condemnation.....	139
Number of buildings acted on by board of health and condemned.....	105
Number of buildings acted on by board of health and not condemned.....	34
Number of buildings abated following condemnation proceedings: By repair, 4; by demolition, 126.....	¹ 130
Number of buildings condemned and remaining unabated.....	49

OPERATION OF PUBLIC HEALTH SERVICE LABORATORY

The Public Health Service laboratory, although located in an old building unsatisfactory for such an installation, has nevertheless functioned satisfactorily during this and preceding years. Arrangements are being made for a modern laboratory structure to be erected on the marine hospital reservation, which will not only be adequate for the routine work now being carried out but will permit of more research investigations.

¹ These include some buildings acted upon during previous years, hence they will not balance.

The laboratory work falls into the following divisions: (a) Routine examinations of rodents to determine plague infections; (b) serological, bacteriological, and pathological work for other Public Health Service stations in the district; (c) service performed for other Government agencies; and (d) special investigations of matters which may affect the public health.

During the year examination was made of 32,000 rats trapped in San Francisco and 3,764 from Oakland. The classification of the rats with totals are submitted in the accompanying tabulated statement. No plague infection was found among the rats examined during the year, although some rat leprosy and hemorrhagic septicemia was noted during the examinations.

All serological work required at the San Francisco Marine Hospital, San Pedro Relief Station, and the Angel Island Immigration Hospital was performed in this laboratory. These examinations are made twice a week. Blood cultures and agglutination tests and some tissue mountings and examination of specimens for pathological conditions also were made.

A large number of samples of water used on interstate carriers, both vessels and trains, were examined. The work for other departments included bacteriological and serological examinations made for the Indian Service, National Park Service, Immigration Service, and the Federal penitentiary at McNeil Island. The work for the latter institution was a new activity and consisted of an average of 30 serological examinations weekly.

The laboratory operations carried on during the year are shown in the following tabulation:

Classification of rats

Rats from San Francisco: <i>Rattus norvegicus</i> 29,749 <i>Rattus rattus</i> 2,063 <i>Rattus alexandrinus</i> 2,348 <hr/> Total 34,160 Rats from fumigated ships: <i>Rattus norvegicus</i> 8 <i>Rattus rattus</i> 507 <i>Rattus alexandrinus</i> 816 <hr/> Total 1,331	Rats from Oakland: <i>Rattus norvegicus</i> 3,681 <i>Rattus rattus</i> 129 <i>Rattus alexandrinus</i> 329 <hr/> Total 4,139 Squirrels: From San Francisco County 65 From Santa Clara County 30 <hr/> Total 95
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Summary of laboratory operations

	Received	Examined
Examinations of rodents for plague:		
Rats from San Francisco.....	34,160	32,000
Rats from Oakland.....	4,139	3,764
Rats from fumigated ships.....	1,331	1,322
Squirrels from San Francisco and Santa Clara Counties.....	95	95
Serological examinations:		
Wassermann reactions (blood).....		5,486
Wassermann reactions (spinal fluid).....		144
Widal reactions.....		1
Bacteriological examinations (culture and microscopic):		
Water.....		397
Blood for diphtheria.....		4
Welch's gas bacillus.....		1
Bacteriological examinations (with animal inoculations): Tuberculosis.....		72
Agglutination test: Abortus and melitensis.....		1
Histological examination.....		1

TRACHOMA-PREVENTION WORK

Trachoma-prevention work is based on two principles—removing sources of infection by bringing active cases under treatment, and educating the families of trachoma patients about the dangers of contracting the disease when careless toilet habits are pursued. Along with this prevention work there arises the necessity of a certain amount of salvage effort. This might be termed direct prevention of blindness. The lid deformities that so often arise in untreated severe trachoma will soon cause blindness unless the lid deformity is corrected. A great deal of vision can often be restored by simple operations.

Trachoma-prevention activities were continued by the Public Health Service, in cooperation with State and local authorities, during the fiscal year 1931 in Missouri, Kentucky, and Tennessee. As a result of a survey made late in the preceding year, new work was undertaken in cooperation with the State board of health in southwestern Georgia. Cooperation also was extended to Illinois and Texas.

Missouri.—In a recent study of the trachoma records from three contiguous counties in southern Missouri covering 2,506 square miles and with a population of 51,000, it was found that 2 per cent of the population had trachoma in either active or arrested state. Of the 1,005 cases in this area, 139 were industrially blind or worse, in both eyes, from trachoma. The trachoma in Missouri is of a more severe type than that found in Kentucky or Tennessee. This fact is especially brought out by a comparison of the virulence index of these areas for the past five years. This virulence index is the ratio between the number of blind eyes from trachoma and the number of individual trachoma cases. The State board of health has taken an increased interest in the trachoma field work and has detailed a full-time nurse to assist in this activity. The number of field clinics have increased, and the treatments given at these clinics have enabled many people to be benefited who otherwise would have been unable to obtain treatment. No operative field clinics were held during the year, due to lack of funds for this phase of the work. The hospital at Rolla, Mo., at this time has a waiting list of 50 names. During the past year there were more days of hospital relief extended than at any time in the history of the institution. The average stay in the hospital increased eight days. This was probably due to many cases of increased virulence being admitted. During the year the efficacy of ultra-violet treatment in trachoma was tried out, as was also diathermy. A water-cooled ultra-violet machine and a diathermy unit were provided for three months through the kindness of a large manufacturer of electric appliances. No results of any significance were obtained with ultra-violet therapy. Diathermy seems to have possibilities in this work. Efforts along this line will continue. The number of applications for treatment from trachoma sufferers in the State of Arkansas continued to increase.

Kentucky.—This State has a virulent form of trachoma, which produces much blindness. Active field work was continued throughout the year. The trachoma hospital at Richmond gave more relief

than at any other time in its history, and the institution has been taxed to its capacity most of the time. A recreation room is badly needed at this place. The medical officer at the hospital in Richmond has been very careful in his choice of patients, and only those cases showing most urgent need of care have been admitted. The percentage of new admissions has been high for the past year. Two months of field work in Knott County during the past fiscal year disclosed only 24 active cases of trachoma. Between 1913 and 1923 there were 742 cases of trachoma hospitalized from this county.

Tennessee.—The trachoma hospital at Knoxville, Tenn., was closed September 30, 1930, as it had served its usefulness. Trachoma survey work in cooperation with the State board of health was continued in the State by a medical officer of the Public Health Service. This survey work has been conducted the past two years for the purpose of studying the incidence of trachoma in Tennessee and to see in what areas it is a real problem. This activity came to an end in April, 1931, with the greater portion of eastern Tennessee surveyed. During the past year 23 counties were surveyed. It is interesting to note that out of 30,277 school children examined only 213 cases of trachoma were found, while out of 2,757 people examined in field clinics and in the home there were 660 cases of trachoma found. This shows that school examinations alone will not suffice for the purpose of obtaining an index of trachoma prevalence.

Georgia.—Work has been carried on in southwestern Georgia for the past five months in cooperation with the Georgia State Board of Health. A fairly large number of trachoma cases have been located through the activities of two field nurses and a local physician who is a part-time employee of the Public Health Service. Treatment clinics were organized at strategic points and held at definite intervals, usually once a week, and in some cases twice a week. These treatment clinics were conducted by a nurse trained in trachoma work and who had seen enough trachoma complications to know when a case is not doing well. Seventy of these clinics have been conducted and 4,943 treatments given by the nurse. One day each week was devoted by the local physician to seeing and treating any trachoma case that needed his services or had been referred in by the field nurse. Suspicious cases were also examined on that day. At irregular intervals several operative clinics were held. The operative cases averaged 6.2 days' hospital care. The Georgia trachoma is of a very mild type and complications are rare.

Illinois.—Diagnostic clinics were held in southern Illinois at the request of the Illinois State Board of Health and much trachoma of a severe type was discovered. The State health commissioner has been employing two field nurses for trachoma work. The attempt has been made to transport the cases needing hospitalization to the Illinois Eye and Ear Infirmary in Chicago.

Texas.—A trachoma survey was carried on in the lower Rio Grande Valley. A trachoma field nurse, with a nurse furnished by the Texas State Department of Health, examined 11,054 individuals. Of these, 1,800 had suspicious lid conditions. Most of these suspicious cases were examined at diagnostic field clinics, and only a few mild active cases of trachoma were found. Several inactive cases of a severe type were found, but all had moved in from other parts of the

country. A very large number of cases of follicular conjunctivitis were seen in both Mexican and American school children. Some schools showed 60 per cent involvement.

Trachoma research.—Research into the etiology of trachoma was continued throughout the year by Dr. Ida A. Bengtson. Material from trachoma cases in southwest Georgia, Kentucky, and Missouri was furnished for this work.

Statistical tables showing the work done in the field clinics and in the hospitals are submitted as part of this report. The tables show particularly the large number of cases that are reached through the field workers and field clinics.

Dispensary and hospital relief, operations, etc., fiscal year ending June 30, 1931

	Bainbridge, Ga.	Richmond, Ky.	Rolla, Mo.	Knoxville, Tenn. ¹	Total
DISPENSARY RELIEF					
Number examined.....	1,522	692	2,275	339	4,828
Old cases trachoma.....	863	245	934	246	2,288
New cases trachoma.....	274	250	405	34	963
Total attendance.....	1,522	692	2,375	339	4,928
Average daily attendance.....	² 54.35	1.89	6.43	4.4	67.07
Corneal opacity from trachoma.....	24	145	158	9	336
Blindness both eyes from trachoma.....	0	1	3	0	4
Blindness one eye from trachoma.....	2	5	24	0	31
Ulcer from trachoma.....	2	35	57	8	102
Pannus from trachoma.....	192	221	347	9	769
Entropion from trachoma.....	3	39	88	2	132
HOSPITAL RELIEF					
Cases admitted during the year (total).....	175	339	320	44	878
Number cases first admission.....	168	244	183	25	620
Days relief furnished.....	1,085	10,238	11,916	1,393	24,632
Rations furnished.....	1,085	12,414	13,611	1,865	28,975
Cost of rations.....	\$423.15	\$4,523.05	\$5,887.61	\$703.83	\$11,537.64
Hospital capacity efficiency.....	-----	0.824	0.882	0.753	-----
Average stay in hospital.....	6.2	30.2	37.23	31.65	-----
Virulence ³ index for past year.....	0.0027	0.028	0.074	0	-----
Virulence index for past 5 years.....	-----	.047	.083	0.023	-----
OPERATIONS					
General anesthesia.....	9	5	1	0	15
Local anesthesia.....	156	199	211	16	581
Grattage.....	157	147	93	15	412
Entropion.....	3	23	55	1	82
Canthoplasty.....	5	32	24	0	61
Tarsectomy.....	0	0	4	0	4
Pterygium, transplant of.....	0	0	6	0	6
Blepharoplasty.....	0	0	1	0	1
Cautery puncture.....	5	0	15	0	20
Ulcer cauterized with iodine.....	0	0	3	0	3
Electric sparking.....	0	0	5	0	5
Kuntz operation.....	0	0	2	0	2
Ectropion.....	0	0	1	0	1
Chalazion, incised and curretted.....	0	1	0	0	1
Evisceration.....	0	1	0	0	1
Trauma.....	0	0	1	0	1
SPECIAL TREATMENTS					
Bimosol.....	0	0	17	0	17
Sterile milk.....	0	0	10	0	10
Autohemotherapy.....	0	0	6	0	6
Typhoid injections.....	0	0	3	0	3
Ultra-violet-ray treatment.....	0	0	281	0	281
Diathermy.....	0	0	291	0	291
Refractions.....	0	0	8	0	8
Salvarsan.....	0	0	2	0	2

¹ Knoxville Hospital closed to patients Sept. 15, 1930.

² Held 1 day a week.

³ Virulence index is figured by taking number of eyes blind from trachoma seen during year and dividing by number of new cases of trachoma. No blind eye counted more than once.

Field activities

	Arkansas	Georgia	Illinois	Kentucky	Missouri	Tennessee	Texas	Total
Number of clinics held.....	1	26	6	12	56	73	11	185
Number persons examined.....	77	3,148	660	1,116	4,121	1,494	1,866	12,482
Trachoma cases seen.....	8	859	245	299	2,058	382	44	3,895
Former hospital cases.....	0	0	0	196	401	86	0	683
Suspicious cases seen.....	5	472	37	4	354	88	75	1,035
Treatments given at clinics.....	0	621	0	400	2,070	346	0	3,437
Physicians.....	4	19	24	33	44	12	0	136
FIELD NURSE ACTIVITIES								
Public talks given.....	1	7	1	57	92	¹ 651	0	809
People (estimated) in audiences....	50	525	150	4,959	4,020	¹ 23,768	0	33,472
Homes visited.....	0	210	0	1,119	1,660	¹ 343	25	3,357
People examined in homes.....	0	993	0	6,003	3,956	^{1 2} 1,263	101	12,316
Number pupils examined in schools....	0	8,137	0	1,448	3,437	^{1 3} 30,277	11,054	54,353
Suspicious cases in schools.....	0	1,167	0	36	58	¹ 187	1,800	3,248
Number treatment clinics, nurse only.....	0	70	0	0	0	0	0	70
Number treatments by nurse.....	0	4,943	0	0	0	0	0	4,943
Total number of new individual trachoma cases discovered.....	8	708	245	233	767	862	44	2,867

¹ Represents work of nurse and field clinician.

² There were 169 cases of trachoma in these homes.

³ There were 213 cases of trachoma among these school children.

SUPERVISION OF WATER SUPPLIES USED BY COMMON CARRIERS

While the cooperative plan between the State health departments and the Public Health Service for the certification of water supplies used on interstate carriers continued in operation as heretofore, certain changes in procedure were made involving some decentralization and more cooperation with the States. This brought about better reporting and increased the number of inspections and certifications, as shown in the accompanying tables.

During the year assistance was rendered various States in making inspections of 98 water supplies used by common carriers.

The yearly inspection and certification of water supplies used by common carriers entails a large amount of work, which may be unnecessarily increased where sources not used are listed by the carrier. Effort toward elimination of sources not used but listed by the carriers has brought about a reduction in number of sources from 2,953 in 1928 to 2,518 in 1930.

The following comparative tabulation of the percentages of completed certification indicates the status of this work and shows the results of the changed procedure:

	1927	1928	1929	1930
Railroad supplies.....	Per cent 80	Per cent 82	Per cent 81	Per cent 87.5
Vessel supplies.....	75	78	78	88.0

INTERSTATE CARRIER WATER SUPPLIES

The following tables covering the calendar year 1930 give the status of this work by States:

Railroad supplies for calendar year 1930

State	Source classification				Certification status				Per cent sources acted upon
	Public ¹	Private ²	Rail-road	Total	Satisfactory	Prohibited	Provisional	Action pending	
Alabama.....	40	0	2	42	42	0	0	0	100
Arizona.....	15	1	5	21	14	0	7	0	100
Arkansas.....	42	6	6	54	23	4	11	16	70
California.....	48	7	26	81	56	1	23	1	99
Colorado.....	27	3	5	35	21	0	11	3	91
Connecticut.....	11	2	0	13	11	0	2	0	100
Delaware.....	6	0	0	6	6	0	0	0	100
District of Columbia.....	1	0	1	2	2	0	0	0	100
Florida.....	43	1	7	51	47	0	4	0	100
Georgia.....	52	1	1	54	47	1	6	0	100
Idaho.....	17	2	9	28	22	4	2	0	100
Illinois.....	66	1	14	81	57	2	22	0	100
Indiana.....	51	0	6	57	19	3	34	1	98
Iowa.....	63	1	6	70	22	1	28	19	73
Kansas.....	71	0	6	77	62	4	4	7	91
Kentucky.....	28	9	12	49	32	0	4	13	73
Louisiana.....	34	4	10	48	40	1	0	7	85
Maine.....	35	0	5	40	21	0	18	1	97
Maryland.....	15	1	1	17	15	0	2	0	100
Massachusetts.....	34	0	0	34	34	0	0	0	100
Michigan.....	63	12	3	78	68	2	6	2	97
Minnesota.....	48	3	21	72	63	3	0	6	92
Mississippi.....	31	2	6	39	36	0	0	3	92
Missouri.....	55	3	5	63	37	3	23	0	100
Montana.....	22	2	9	33	23	1	4	5	85
Nebraska.....	33	0	17	50	0	1	0	49	2
Nevada.....	9	1	12	22	19	1	2	0	100
New Hampshire.....	20	0	1	21	21	0	0	0	100
New Jersey.....	30	0	0	30	28	0	0	2	93
New Mexico.....	8	1	11	20	16	0	4	0	100
New York.....	85	3	13	101	86	2	13	0	100
North Carolina.....	43	1	4	48	42	1	5	0	100
North Dakota.....	16	2	9	27	10	0	1	16	41
Ohio.....	66	2	12	80	67	4	3	6	93
Oklahoma.....	47	0	3	50	25	3	8	14	72
Oregon.....	28	1	4	33	27	4	0	2	94
Pennsylvania.....	118	6	15	139	58	0	0	81	42
Rhode Island.....	2	0	0	2	2	0	0	0	100
South Carolina.....	29	2	1	32	32	0	0	0	100
South Dakota.....	23	0	8	31	15	1	5	10	68
Tennessee.....	28	4	6	38	35	1	2	0	100
Texas.....	112	7	45	164	51	1	112	0	100
Utah.....	11	4	5	20	17	0	3	0	100
Vermont.....	12	1	1	14	13	0	1	0	100
Virginia.....	40	1	4	45	36	0	0	9	80
Washington.....	26	1	4	31	26	2	2	1	97
West Virginia.....	30	6	6	42	37	2	3	0	100
Wisconsin.....	52	12	11	75	48	7	15	5	93
Wyoming.....	13	0	2	15	9	0	6	0	100
Totals.....	1,799	116	360	2,275	1,540	60	396	279	87.5

¹ This column includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.

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

³ Based upon watering point sanitation as well as source of supply.

Recapitulation of railroad supplies by districts

District	Source classification				Certification status				Per cent
	Public	Private	Rail-road	Total	Satisfactory	Prohibited	Provisional	Action pending	
5.....	118	17	64	199	143	2	50	4	98
2.....	259	13	25	297	264	4	20	9	97
6.....	106	6	28	140	107	11	14	8	94
4.....	488	35	101	624	383	17	164	60	90
3.....	481	33	107	621	369	24	114	114	82
1.....	347	12	35	394	274	2	34	84	79
Totals.....	1,799	116	360	2,275	1,540	60	396	279	87.5

Vessel supplies for calendar year 1930

State	Source classification				Certification status				Per cent sources acted upon
	Public ¹	Private ²	Company	Total	Satisfactory	Prohibited	Provisional	Action pending	
Alabama.....	1	0	0	1	1	0	0	0	100
Arkansas.....	2	0	0	2	0	0	0	2	0
California.....	19	2	1	22	12	0	3	7	68
Connecticut.....	8	0	0	8	8	0	0	0	100
Delaware.....	2	0	0	2	2	0	0	0	100
District of Columbia.....	1	0	0	1	1	0	0	0	100
Florida.....	4	3	3	10	10	0	0	0	100
Georgia.....	2	0	0	2	2	0	0	0	100
Illinois.....	5	1	0	6	4	1	1	0	100
Indiana.....	5	0	0	5	1	0	3	1	90
Kentucky.....	3	0	0	3	1	0	1	1	67
Louisiana.....	2	2	2	6	6	0	0	0	100
Maine.....	9	0	0	9	5	0	4	0	100
Maryland.....	5	2	1	8	7	0	1	0	100
Massachusetts.....	16	0	0	16	16	0	0	0	100
Michigan.....	9	0	0	9	9	0	0	0	100
Mississippi.....	4	0	0	4	3	0	0	1	75
Missouri.....	1	0	0	1	1	0	0	0	100
New Hampshire.....	1	0	0	1	1	0	0	0	100
New Jersey.....	13	3	0	16	14	0	0	2	88
New York.....	14	1	0	16	15	0	0	0	100
North Carolina.....	2	0	0	2	2	0	0	0	100
Ohio.....	9	0	0	9	9	0	0	0	100
Oregon.....	8	0	0	8	4	0	4	0	100
Pennsylvania.....	7	0	0	7	1	0	0	6	14
Rhode Island.....	4	0	0	4	4	0	0	0	100
South Carolina.....	3	0	1	4	4	0	0	0	100
Tennessee.....	2	0	0	2	2	0	0	0	100
Texas.....	7	7	2	16	5	2	9	0	100
Vermont.....	1	0	0	1	0	0	1	0	100
Virginia.....	12	0	2	14	8	0	0	6	57
Washington.....	20	2	0	22	17	2	0	3	86
West Virginia.....	3	0	0	3	3	0	0	0	100
Wisconsin.....	4	0	0	4	4	0	0	0	100
Total.....	208	23	12	243	182	5	27	29	88

¹ This column includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.

² A "private" supply refers to a small well or spring used only by the carrier and the person owning it.

Reciprocity with the Department of Pensions and National Health of Canada, covering both the certification of water supplies used by common carriers crossing the international boundary and inspection of vessels operating on the Great Lakes and border waters, continued. During the year certificates were received from the Canadian authorities covering 34 supplies used by United States carriers operating in Canada, and 13 certificates were forwarded to them covering supplies used by Canadian carriers operating in the United States.

RAILWAY SANITATION

Cooperation with the joint committee on railway sanitation of the American Railway Association was continued throughout the year. The report of the committee was completed in June, but had not been acted upon at the close of the year. One engineer devoted a considerable portion of his time to the work of this committee in the preparation of the report and in carrying on tests of devices in service or proposed.

Two hundred inspections of coach yards and terminals were made as time would allow and corrections in sanitary conditions brought about. There appears to be some difference of opinion as to jurisdiction over the sanitation and handling of drinking water in coach yards and at watering points. In general, the States have considered this is a function of the Public Health Service and have not included such work in their regular control activities. Illinois is the only State considering the handling of water by the railroads as an integral part of the carrier drinking-water-supply system and bases its recommendations for certification on the water as delivered to the cars rather than to the yard. At the close of the year Texas adopted the same procedure.

SUPERVISION OF WATER-SUPPLY SYSTEMS ON VESSELS

Control over drinking and culinary water-supply systems on vessels engaged in interstate traffic has been extended during the year. With more routine inspections and the issuance of regular certificates, greater interest is being shown by vessel owners. The number of temporary certificates issued is being rapidly decreased, and plans are being made to discontinue issuance of this type of certificate.

Requests for inspection and advice by companies operating vessels in foreign traffic, as well as by Federal agencies, indicate increased interest in properly protecting drinking-water supplies aboard vessels.

During the year 317 vessels received their first inspection, while 807 were reinspected. The number of favorable certificates issued was 895.

The following table gives the status of this work for the calendar year 1930:

Certification of vessels for calendar year of 1930

District	Vessels on active status	Per cent of total vessels in district	Per- manent certifi- cations	Tempo- rary certifi- cations	Total certifi- cates issued	Per cent of dis- trict total certified	Per cent of total vessels certified
1.....	862	40.6	91	377	468	54.2	22.1
2.....	102	4.8	96	4	100	98	4.7
3.....	546	25.0	454	58	512	93.7	24.2
4.....	198	9.3	40	126	166	80.3	7.8
5-6.....	410	19.0	214	68	282	68.7	13.3
Total.....	2,118	-----	895	633	1,528	-----	72.1

Percentage of total given permanent certificates, 42.2; percentage of total given temporary certificates, 29.9.

NOTE.—Only the latest certificate issued on a vessel was counted in case that vessel was both temporarily and permanently certified during the year.

Investigations were made of cases of typhoid fever occurring among crews and passengers where indications were such as to implicate water supplies. During the year 63 cases were reported as occurring among crews, a reduction of 12 cases over 1929. Of this number 17 occurred on Federal vessels not under the jurisdiction of the Interstate Quarantine Regulations.

SHELLFISH SANITATION

The procedure in carrying on this work was not changed during the year. However, changes are being considered in an effort to encourage and maintain greater activity on the part of the producing States. Listing of certified dealers is instrumental in maintaining fairly satisfactory control, its efficiency depending upon the use made of the list by the consuming States and cities.

The establishment of chlorinating plants for treating clams in Massachusetts is a forward step, and the results obtained in that State are being watched with great interest.

Some change or modification of the present method of bacterial examination of shellfish, and particularly soft clams, has been indicated by the laboratory work carried on in connection with the shellfish-conditioning plants.

During the year 1,060 certificates were approved, and the number of shippers listed at the close of the year was 1,550.

Reciprocity with the Canadian Department of Pensions and National Health continued, and that department was supplied with copies of all certificates issued by the producing States. They, in turn, certified 32 Canadian shippers.

PUBLIC HEALTH ENGINEERING ABSTRACTS

The demand for this publication has shown an increase, as have references to it in the technical literature.

The abstracts issued during the year totaled 1,398. They required 442 mimeographed pages and were taken from 115 domestic and 157 foreign publications.

The following table gives the status of this publication for the year 1931 in comparison with the preceding years:

	Fiscal year ended June 30			
	1928	1929	1930	1931
Publications available.....	116	207	295	312
Abstractors.....	85	87	89	97
Weekly issues.....	53	52	52	52
Articles abstracted.....	896	1,426	1,445	1,398
Mailing list.....	684	835	883	986

COOPERATIVE SANITARY WORK

The cooperative sanitary engineering work with other divisions of the Public Health Service and other Federal and State governmental agencies was extended during the year. A total of 1,250 engineer days were devoted to this cooperative work.

The work with the National Park Service and Office of Indian Affairs, in connection with surveys, reports, preparation of plans, and advice, occupied a major part of the time devoted to this cooperative work, amounting to 824 days. Assistance rendered the

Supervising Architect's Office in making surveys and recommendations for water supply and sewage disposal at the new border customs and immigration stations required considerable time during the year.

Additional governmental agencies to which assistance was rendered were:

(1) Lighthouse Service: Studies of drinking-water systems on vessels, with advice as to corrections.

(2) Bureau of Prisons: Reviews of plans, surveys, and advice relative to sanitation of institutions.

(3) District of Columbia: Studies of the disintegration of a concrete sewer, and assistance in the mosquito control problem.

(4) Veterans Bureau, Coast Guard, Army, Reclamation Service, Forest Service: Surveys and advice relative to matters of sanitation.

(5) Utah, Indiana, Massachusetts: Surveys and advice relative to mosquito control measures.

MOSQUITO CONTROL, DISTRICT OF COLUMBIA

With the passage of the necessary legislation and appropriations, active control measures were instituted in August, 1930. The work was organized in accordance with the plan presented in a report prepared by the Public Health Service in 1929. At the request of the Commissioners of the District of Columbia and the Director of Public Buildings and Public Parks, the two major agencies involved, the Public Health Service was requested to coordinate and supervise the work.

The control problem, as such, offers no particular difficulty; but the fact that, in addition to the District of Columbia and the Office of Public Buildings and Public Parks, there are some 28 other Federal and district agencies having jurisdiction over certain areas complicates the problem.

All agencies have cooperated in carrying on a coordinated control, permitting the setting up of a reasonably smooth running control organization.

SUMMARY OF WORK CARRIED ON BY THE VARIOUS DISTRICTS

Distribution of time in days of the field personnel under the engineering section, fiscal year, 1931

Interstate quarantine:	
Office.....	1, 279
Field—	
Water.....	880
Shellfish.....	342
National Park Service:	
Office.....	290
Field.....	96
Indian Service:	
Office.....	201
Field.....	137
Other agencies:	
Office.....	274
Field.....	282
Technical meetings.....	34
Leave.....	223
Total days accounted for.....	4, 038

TABULAR SUMMARY OF ACTIVITIES IN ALL DISTRICTS, FISCAL YEAR 1931

Vessel water-supply supervision

Inspections:		Plans of vessel water systems examined:	
First inspections—		Approval granted -----	31
Passenger carrying ----	139	Approval withheld -----	23
Freight (only) -----	174	Major conferences:	
Water boats -----	4	With shipping officials ----	79
Reinspections—		With others -----	28
Passenger carrying ----	373	Water examinations made:	
Freight (only) -----	423	U. S. Public Health Service	
Water boats -----	11	laboratories -----	4
Certificates issued:		Other laboratories -----	2,563
Regular, favorable—		Typhoid fever cases reported:	
Passenger carrying ----	407	U. S. Public Health Service	
Freight (only) -----	634	hospitals -----	47
Water boats -----	7	U. S. Public Health Service	
Regular, unapproved ----	1	quarantine stations ----	1
Temporary, favorable—		Health departments -----	15
Passenger carrying ----	185		
Freight (only) -----	415		
Water boats -----	7		

Railroad sanitation supervision

Inspections:		Water examinations made:	
Sources of water supply ----	98	U. S. Public Health Service	
Coach yards -----	130	laboratories -----	502
Terminals -----	65	Other laboratories -----	1,825
Watering points -----	5	Major conferences:	
Dining cars -----	49	With railroad officials ----	62
Certification:		With others (principally	
Data reports reviewed ----	1,836	health authorities) -----	91
Certificates prepared for			
States -----	2,338		

Shellfish sanitation supervision

Inspections:		State certificates—Continued.	
Areas -----	5	Canceled -----	98
Plants -----	688	Laboratory examinations made:	
State certificates:		U. S. Public Health Service	
Approved -----	1,060	laboratories -----	628
Not approved -----	6	Other laboratories -----	674
Approval withdrawn -----	0	Conferences -----	118

Miscellaneous

Cooperation with Governmental agencies:		Cooperation with Governmental agencies—Continued.	
Public Health Service—		Supervising Architect's Of-	
Surveys -----	6	fice—	
Conferences -----	11	Surveys -----	26
Office of Indian Affairs—		Conferences -----	43
Surveys -----	64	State health departments—	
Conferences -----	40	Surveys -----	3
National Park Service—		Conferences -----	42
Surveys -----	27	Other Governmental	
Conferences -----	44	agencies—	
Bureau of Prisons—		Surveys -----	25
Surveys -----	16	Conferences -----	22
Conferences -----	23		

INTERSTATE SANITARY DISTRICTS

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

Sanitary Engineer L. M. Fisher was in charge of the district during the year. The activities carried on are grouped as follows: (1) Shellfish sanitation; (2) vessel water-supply and sanitation supervision; (3) railroad water-supply and sanitation supervision; (4) miscellaneous activities, including cooperation with State health departments, local health departments, and Federal agencies in dealing with special health problems.

SHELLFISH SANITATION

Many of the shellfish sanitation activities were concerned with the supervision of the soft-clam industry. High scores of shucked clams continued to be reported at intervals by New York City, particularly of clams that are sold strung in bunches and originating at points in New Jersey, near Highlands. The managers of the shucking houses where these clams are prepared went to considerable expense to remedy unsatisfactory plant conditions, and some improvement in the scores was noted, but not as much as was anticipated before the improvements were effected. New Jersey carried on clam-treatment experiments for a short period, using chlorine somewhat along the lines followed in Massachusetts, but discontinued these experiments until a later time, pending the outcome of results obtained elsewhere.

A considerable amount of work was carried on in cooperation with the Massachusetts State Department of Public Health in studying and improving the clam-chlorination process. A field laboratory was established at Newburyport, Mass., and later transferred to Plymouth, where facilities for experimental work were better and the laboratory was more accessible.

On examining treated clams by our "shot" method, devised in 1927 while oyster meats were being examined, it was noted that scores obtained in this way were not as low as those obtained by examining shell liquor only. The apparent reason for this discrepancy was probably due to the fact that in the beginning the chlorination plants were operated with 0.5 parts per million of free chlorine present in the water a large proportion of the time. A chlorine content as high as this interferes with the free feeding of the clams, the result being that the shell liquor is at least partially sterilized, while the intestinal tract, gills, and other parts of the clams are not adequately cleansed. The treatment process was so changed as to allow for the presence of free chlorine in detectable quantities only during a portion of the treatment period.

Our experiments also disclosed that clams will not feed actively if air is blown through the water continuously. As a result, the treatment process was further modified and the blowing of air was limited to a 15-minute period each 3 hours in order to mix the chlorine solution added to the tanks. The studies also disclosed that the greatest part of the contamination was removed from the clam in the first 24 hours of treatment, that no great improvement

resulted from the second 24 hours, and that there was residual contamination, which was difficult, if not impossible, to remove without excessively long treatment periods. Experiments to ascertain whether the treatment period could be shortened to less than 24 hours indicated that it would be unwise to do so.

Observations made during freezing weather indicate that there is serious interference with the treatment process if the clams are frozen hard after being dug. Digging on extremely cold days probably should be prohibited. Such days are, however, comparatively rare.

Examinations made of conditioned clams shucked in commercial shucking houses showed high scores. Investigation of this phase of the problem seems to indicate that even when clams coming from approved areas are shucked in commercially operated shucking houses under reasonably clean conditions the scores are considerably higher than when the same clams are opened in the laboratory for examination. The determination of a suitable standard for shucked soft clams remains at the present time somewhat in doubt, but it is apparent that the present standard for shellfish is not applicable to the soft clam.

As a result of the operation experiments conducted by the State department of public health and the findings from our own studies, it was recommended that the Public Health Service grant provisional approval of the process under certain operating conditions, but that further studies to improve the product be continued. It was also recommended that the State health department be given authority by the legislature to license all wholesale shellfish plants regardless of whether or not their product is shipped interstate.

Following the success attained at the two plants in operation during the year, an additional plant was completed just before the close of the fiscal year, and a fourth plant is being planned for early construction. Investigation made of clams found on the Rhode Island market disclosed that a considerable percentage came from treatment plants in Massachusetts.

In the light of experience gained during the year the regulations governing the operation of clam-treatment plants were revised by the Massachusetts State Department of Public Health, and the revised regulations were approved by the Public Health Service.

Additional shellfish legislation was enacted in Maine and in Massachusetts—in Maine, to give the State agriculture department specific authority to deal with the various problems involved, and in Massachusetts, further to amplify the existing law.

Conferences with members of State legislatures and State health authorities were attended at various times for the purpose of furnishing information in connection with proposed shellfish legislation.

Arrangements were completed to make detailed studies of laboratory methods followed in one of the States in this district exercising jurisdiction over shellfish problems, some question having arisen as to the adequacy of the methods employed. At the close of the fiscal year studies had not been completed, due to illness and other delays.

Special shellfish studies were made in the Public Health Service laboratory in New York with a view to ascertaining whether there could be evolved a more satisfactory method of expressing the amount

of contamination present in a sample than the present score method, the object being to find a practical way of expressing the number of *B. coli* organisms per shellfish through the use of fermentation tubes only.

A week was spent by our technician in the laboratory of the New Jersey State Board of Health aboard the launch *Inspector* for the purpose of observing the methods followed in that laboratory and to assist in training personnel recently added to the department. In the oyster industry conditions throughout the year were, on the whole, quite satisfactory. Supervised water storage continues in New Jersey. Conditions in Tuckerton Creek are not all that could be desired, and it is probable that some changes will have to be instituted if approval of State certification is to continue.

Three cases of typhoid fever occurring at Castine, Me., and believed by the local health officer to be due to contaminated clams, were investigated. While the investigation indicated that the cases studied were related to a larger outbreak at Bucksport, the conditions under which clams were handled and stored at Castine could easily have resulted in contaminating them. The clams were not handled by dealers licensed to ship clams in interstate commerce. Assistance was rendered the State in correcting the conditions found.

Early in the fiscal year it became necessary for the district engineer to notify a shellfish-producing State in this district that he could not longer indorse certificates issued by that State to interstate shippers of shellfish unless certain recommended improvements were made. As a result of this refusal to recommend certification, extensive changes and improvements were instituted.

At the request of the National Association of Shellfish Commissioners, a paper on clam chlorination was prepared and read at their annual meeting.

SUPERVISION OVER VESSEL WATER-SUPPLY SYSTEMS AND SANITATION

Following the report to this office of four cases of typhoid fever occurring among the crew of a vessel arriving in New York from a cruise around the world, an investigation was made as to the probable source of the infection. The vessel took water at 15 foreign ports and the crew was given shore liberty at most of the ports. Samples of water examined later showed the presence of contamination. The ship's surgeon, who had not diagnosed the cases of typhoid fever, was of the opinion that the infection was acquired ashore, but conditions surrounding the water supply were such as to make it entirely possible for the infection to have been water borne. Members of the crew reported that sailors with symptoms similar to those whose illness was diagnosed as typhoid fever were put ashore at other places before reaching New York. It should be noted that vessels engaged in foreign commerce do not come under the jurisdiction of the Interstate Quarantine Regulations, and recommendations for changes aboard such vessels can not be enforced by this office.

Owing to the limited personnel attached to this office, it is not practicable to inspect all the vessels whose headquarters are in this district without sacrificing more important work. Practically all the passenger-carrying vessels were inspected, and conditions on the

whole were found quite satisfactory. Vessel owners generally showed a willingness to cooperate in safeguarding the health of passengers and crews by carrying out such recommendations as this office deemed necessary.

Owners of vessels being built for the foreign trade sought approval of the drinking-water systems aboard such vessels. In most instances such approval could be given, particularly if plans covering the vessel water-supply system were first reviewed by this office. Where opportunity to review such plans was not accorded, approval of the completed work could not be given, since the drinking-water system was not separate from other water systems aboard the vessel. Arrangements were made with a large shipbuilding company whereby a representative from this office could be present at the trial trip of newly completed vessels if considered advisable.

Assistance was rendered the chief engineer of the Canadian Department of Pensions and Public Health in dealing with problem of chlorinating drinking water aboard Canadian vessels. In view of the regulations of the Steamboat Inspection Service, whereby the carrying of chlorine gas either as cargo or as stores aboard passenger vessels is prohibited, the treatment of drinking water with chlorine must be effected by use of chlorine solutions. This is the procedure followed on the Great Lakes. No vessels in this district chlorinate their drinking-water supplies, all drinking water being obtained from approved sources ashore.

Statistics showing vessel inspections made and other vessel work carried on are presented in the summary table.

RAILROAD WATER SUPPLY AND SANITATION SUPERVISION

Samples of water collected from railway coaches passing through Albany, N. Y., were examined by the State health department and results were reported to this office. Some of the samples did not meet the Treasury standard. In some instances this was due to the placing of a cloth strainer over the water spigot, particularly in dining cars operated by a large railway system. At our suggestion this practice was discontinued.

At the request of certain of the State health departments the new procedure for certification of railroad drinking-water supplies was modified in this district further to simplify the procedure. Certificates for each railway taking water at a given watering point, accompanied by a report showing the quality of the water and the results of the sanitary inspection, are forwarded by the State to this office. Proper notations are made for record purposes, and copies of the certificates and reports are transmitted the Public Health Service in Washington.

Due to the fact that the Joint Committee on Railway Sanitation has not yet completed its report on which the Manual of Railway Sanitary Practice is to be based, and due to the fact that the assistant engineer was devoting all of his time to the work of this committee, little field inspection work in connection with railway sanitation was carried on. Several of the larger railroad systems assisted in gathering data for the report of the joint committee.

Experiments were conducted to ascertain whether water drawn from railroad coach coolers that were not cleaned at regular intervals

continued of a satisfactory quality, upon the efficiency of a hose protector devised for the Joint Committee on Railway Sanitation, and on the washing of filter stones and in filtering water in dining cars.

The certification of railway watering supplies is satisfactory in all of the States in this district but one.

MISCELLANEOUS

A large number of miscellaneous activities continued to claim the attention of this office.

At the direction of the Surgeon General, meetings called by a group of public-spirited citizens anxious to lessen the pollution of harbor and coastal waters in the vicinity of New York City were attended, and assistance was rendered in organizing those interested in this matter. Various meetings were held throughout the year, and a commission was appointed by the Governors of New Jersey, New York, and Connecticut to make recommendations to the State legislatures on which a treaty between the three States could be based. This office is now cooperating with this commission in their work.

Assistance was rendered the Veterans' Bureau hospital at Northport, Long Island, in connection with problems arising at their sewage-treatment plant.

The Supervising Architect's Office was assisted in the preparation of plans for water-supply and sewage treatment at a number of border inspection stations to be built for the customs and immigration authorities at points on the Canadian border in this district. In this connection inspections were made and plans and reports prepared for each of the following stations: Eustis, Me.; East Richford, Beecher Falls, and Derbyline, Vt.; Rouses Point (two stations), Champlain, Chateaugay, and Trout River, N. Y.

Assistance was rendered in the matter of deciding upon type of sewage-treatment structures for the Federal penitentiary at Lewisburg, Pa.

A study was made of the ventilation system for the Federal detention headquarters, New York City.

Assistance was rendered the Westchester County Sewerage Commission in determining the effect that the discharge of sewage from Westchester County would have on shellfish-growing areas in Long Island Sound.

Investigation was made of a typhoid-fever case occurring at the Coast Guard station at Loveladies Island, Highpoint, N. J.

Inspections were made of prison camps for the Department of Justice at Fort Wadsworth, Staten Island, and Camp Dix, N. J., and of milk-pasteurization plants supplying these camps with milk.

Information was collected from various cities and States regarding rules and regulations covering the installation, operation, and maintenance of refrigerating plants and was forwarded to the secretary of the Mechanical and Electrical Engineers Association, Johannesburg, South Africa.

Efforts were continued to foster the distribution of prophylactic tubes by shipping companies among members of the American merchant marine in order to prevent the occurrence of venereal disease.

Assistance was rendered the Salt Lake City Mosquito Abatement District in problems having to do with the control of both disease-carrying and pestiferous mosquitoes at Salt Lake City, Utah, and vicinity, and also the State health officer of Indiana in dealing with a mosquito-control problem in that State.

At the request of the commanding officer at Fort Totten, N. Y., surveys were made of mosquito prevalence at that fort.

Assistance was rendered the Massachusetts State Drainage Board on various occasions in connection with their efforts to lessen mosquito prevalence, particularly in the coastal section of the State.

Opportunity occurred to experiment with a new type of ultra-violet lamp in sterilizing water. These experiments were made in connection with studies on processes for purifying contaminated clams.

Detailed plans and specifications were prepared in this office for sewage structures at the marine hospital at Vineyard Haven, Mass.

Assistance was rendered the Federation of Sewage Works Association in formulating their plan for research work in sewage-disposal problems.

At the request of the State health officer of Maine, the district engineer presided at the public health engineering section of the New England Health Institute held at Portland, Me.

The district engineer continued to represent the service on a sectional committee of the American Standards Association, engaged in formulating standard specifications for household refrigerators.

TABULAR SUMMARY

Vessel water-supply supervision

Inspections:		Plans of vessel water systems examined:	
First inspections—		Approval granted-----	23
Passenger carrying----	52	Approval withheld-----	23
Freight (only)-----	16	Major conferences:	
Water boats-----	4	With shipping officials----	20
Reinspections—		With others-----	13
Passenger carrying----	30	Water examinations made:	
Freight (only)-----	12	U. S. Public Health Service	
Water boats-----	1	laboratories-----	4
Certificates issued:		Other laboratories-----	17
Regular, favorable—		Typhoid fever cases reported:	
Passenger carrying----	62	U. S. Public Health Service	
Freight (only)-----	18	hospitals-----	20
Water boats-----	0	U. S. Public Health Service	
Regular, unapproved-----	0	quarantine stations-----	0
*Temporary, favorable—		Health departments-----	15
Passenger carrying----	65		
Freight (only)-----	284		
Water boats-----	5		

Railroad sanitation supervision

Inspections:		Water examinations made:	
Sources of water supply----	0	U. S. Public Health Service	
Coach yards-----	6	laboratories-----	386
Terminals-----	3	Other laboratories-----	220
Watering points-----	1	Major conferences:	
Dining cars-----	4	With railroad officials-----	28
Certification:		With others (principally	
Data reports reviewed-----	129	health authorities)-----	20
Certificates prepared for			
States-----	151		

Shellfish sanitation supervision

Inspections:		Laboratory examinations made:	
Areas.....	1	U. S. Public Health Service	
Plants.....	58	laboratories.....	628
State certificates:		Other laboratories.....	674
Approved.....	591	Massachusetts Department	
Not approved.....	0	of Public Health.....	1,193
Approval withdrawn.....	0	Conferences.....	78
Canceled.....	11		

Miscellaneous

Cooperation with governmental agencies:		Cooperation with governmental agencies—Continued.	
Public Health Service—		U. S. War Department—	
Surveys.....	1	Surveys.....	3
Conferences.....	3	Conferences.....	7
Coast Guard—		U. S. Veterans' Bureau—	
Surveys.....	1	Surveys.....	3
Conferences.....	2	Conferences.....	5
Bureau of Prisons—		State health departments—	
Surveys.....	4	Surveys.....	1
Conferences.....	9	Conferences.....	28
Supervising Architect's Office—		Salt Lake City Mosquito Abatement District—	
Surveys.....	11	Surveys.....	1
Conferences.....	35	Conferences.....	6

DISTRICT NO. 2.—DELAWARE, MARYLAND, VIRGINIA, WEST VIRGINIA, DISTRICT OF COLUMBIA, NORTH CAROLINA, SOUTH CAROLINA, GEORGIA, AND FLORIDA

PERSONNEL AND ACTIVITIES

The work carried on in Interstate Sanitary District No. 2 was under the direction of Passed Asst. Sanitary Engineer Arthur P. Miller during the entire year, with the exception of a period of three months when Passed Asst. Sanitary Engineer E. C. Sullivan was in temporary charge. On August 1, 1930, Assistant Sanitary Engineer J. L. Robertson, jr., was detached from this station and assigned to other work. The vacancy was not filled until June 20, 1931, when Asst. Sanitary Engineer Vincent B. Lamoureux was detailed to this station.

The activities of this station may be arranged in order of importance, as follows:

(1) Shellfish sanitation, which broadly includes joint investigations with State authorities of shucking houses and shellfish-producing areas and such cooperative efforts as may be necessary in connection with special problems or difficulties.

(2) Inspection and supervision of water-supply systems, storage facilities, and other sanitary and water appurtenances on interstate carriers.

(3) Investigation of the devices and methods used by railroads in watering cars.

(4) Technical assistance to other Government departments and bureaus.

(5) Cooperation with State health departments in connection with matters jointly affecting them and the Public Health Service and in the certification of common-carrier drinking-water-supply sources.

SHELLFISH SANITATION

The procedure of this office in connection with this activity has been the same as in previous years. Joint inspections of shucking houses are made and assistance is given in the study of shellfish-producing areas. After each series of inspections it has been the policy to make a definite report to the State concerned. Due to lack of sufficient personnel this year the number of inspections made of shucking houses fell to 171, as compared with 198 last year. However, an adequate amount of work was done to permit the formulation of an opinion concerning the effectiveness of the State inspection machinery. In Virginia the administration of the laws relating to the transplantation of oysters by the commission of fisheries moved more smoothly this year than in previous seasons. The State agencies have endeavored to enforce effectively their regulations in this connection, and apparently have met with some success. This office has always insisted that these regulations can be made effective if proper supervisory attention is given to the personnel carrying them out. Our relations with the bureau of shellfish sanitation of the Virginia State Department of Health have continued, and our cooperative work in connection with the improvement of the shellfish industry through better sanitation has been successful to some extent.

In North Carolina the problem of the small shucking houses, usually located in the owner's back yard and used only by the owner or his relatives, has not yet been solved. Pending a better solution of the problem, the regular State regulations on shucking houses are being enforced on these very small ones. At Morehead City it is believed that this particular difficulty could be surmounted if the city authorities would build a cooperative shucking house for these small dealers. However, the city government did not act on this suggestion this year. Work in North Carolina would be more effective also if the field work could be handled by one of the full-time and regular employees of the State board of health rather than by a part-time one. This is particularly true when consideration is given to the fact that resurveys of some of the shellfish-producing areas, and especially the boundaries of those areas, are necessary from time to time. When the part-time inspector on shellfish work is employed only during the winter, he is not available for any resurvey work necessary during the summer. In Florida, in so far as shucking houses are concerned, the supervision is becoming quite effective. At Apalachicola, the largest site of the industry, two shucking houses have installed blowers for the cleansing of the shucked shellfish. These are the first blowers seen in the South. To control effectively shell stock shipped out of the State in bags and barrels, a double-tag system has been put into use. Double tags are issued to firms wishing to ship shell stock. One of the tags is then attached to a shipment and the other, a duplicate, is kept in the records of the shipping house. In case it is necessary to trace shipments or if complaint is received about a shipment bearing a certain tag, the tags on file at the particular shipping house against which the complaint has been made can be checked over. Inasmuch as the tags are numbered serially, each one must be accounted for. The patrol of condemned areas in Florida is handled by the shellfish

commission of the Department of Agriculture. The operation of this part of the State's shellfish control is not entirely satisfactory.

Improvement has been made in the Georgia shucking houses. In previous years the authorities there have been somewhat lax in the enforcement of their requirements, but this year rigid enforcement was insisted upon, and there has resulted a number of new and up-to-date houses. However, in this State laboratory facilities for shellfish work were lacking during almost the entire year and the patrol of restricted areas was ineffective.

In Maryland and Virginia the solution of the returnable container problem is still lacking. A definite stand either against all returnable containers or against the existing ones of poor design is needed. Last year it was thought that the problem was solved by arranging for the retinning of all existing returnable containers and their definite marking as to ownership. It is believed that a large percentage of them were retinned, but the indication of ownership in a similarly large percentage was lacking. This indication of ownership is necessary in order that when defective containers are found responsibility for their condition can be laid on the proper owner. If no indication of ownership exists on a can, defective cans will be disowned by everyone in whose place of business they are found.

In Delaware closed shellfish areas were used during the season. The laws of the State were held to be ineffective against this condition, and new laws were to be sought from the State legislature so that the closure of an area could be made more stringent.

The station was somewhat hampered during the season because of the lack of adequate charts showing shellfish areas, and particularly restricted grounds. Toward the close of the year an engineering assistant was placed on duty for the purpose of bringing these charts up to date and making them of value in field work. An effort was made when possible to call on city health officers and to discuss with them the desirability of a close check of markets and retail stores to see that only oyster stock from certified shippers was being sold. Such effective control, however, can only be possible when there is sufficient personnel to call on the majority of the larger cities more than once a season. Adhering to previous standards, the States have been asked to report on the inspections of their shucking and shell houses once a month and to inspect shucking houses once a month and shell houses approximately once every two months. The following tables show the number of shucking houses inspected by the States and compare the number of inspections by States reduced to a "per house per month" basis for 1931 and 1930:

TABLE 1.—*Number of shucking-house inspections as reported by States*

State	1930				1931			
	Septem-ber	October	Novem-ber	Decem-ber	January	February	March	Total
Delaware.....	7	0	7	7	7	7	0	35
Florida.....	0	0	25	24	21	20	0	90
Georgia.....	14	19	21	23	26	23	25	151
Maryland.....	6	166	175	171	211	148	286	1,163
North Carolina.....	0	38	44	42	39	39	27	229
South Carolina.....	15	1	19	16	22	6	16	95
Virginia.....	2	81	178	228	326	140	155	1,110
Total.....	44	305	469	511	652	383	509	2,873

TABLE 2.—Number of inspections by States, reduced to "per house per month" basis

State	Shucking				Shell			
	Inspections per month over period September to March	Average number of plants active per month	Inspections per house per month		Inspections per month over period September to March	Average number of plants active per month	Inspections per house per month	
			1930-31	1929-30			1930-31	1929-30
Delaware.....	5.0	5.9	0.8	1.0	0.0	0.0	0.0	0.0
Florida.....	12.9	27.0	.5	.9	2.3	8.7	.3	.3
Georgia.....	21.6	19.9	1.1	1.1	6.4	5.4	1.2	1.1
Maryland.....	166.1	226.1	.7	.8	2.1	13.6	.2	.06
North Carolina.....	32.7	28.4	1.2	1.0	.0	13.6	.0	.0
South Carolina.....	13.6	21.9	.6	.7	.4	11.1	.04	.1
Virginia.....	158.6	167.7	.9	.8	3.1	187.7	.01	.004
Total.....	410.4	496.9	.8	.8	14.4	240.1	.06	.016

In briefly summarizing shellfish work in this territory it may be said that the activity of inspecting shucking houses is improving and that the general character of the shucking house is on the upward grade, but that the control of the shellfish-producing areas, with particular respect to their frequent investigation to ascertain whether restriction lines are properly set and the policing of condemned areas to see that oysters are not illegally taken therefrom, are not satisfactorily carried out.

VESSEL WATER SUPPLIES AND SANITATION

The inspection of vessels operating in interstate traffic in this territory is usually done by one inspector, who is placed on duty for three months during the summer. Most of the corrective measures necessary have been taken by the vessel companies in the Southeast, and therefore the inspections are now reduced to a routine character. The cooperation offered by the owning companies has been very gratifying, and the fact that the same inspector has been kept on duty for six years has assisted in this work immeasurably, because of his knowledge of the officials, masters of the boats, and locations of the docks. For the first time in the history of this station 100 per cent certification of vessels during a stated calendar year was accomplished. In previous years this figure has been closely approached, but never before reached during the season. Only four noncompliance notices were issued covering violations of the Interstate Quarantine Regulations. It is again suggested that consideration be given to permitting certificates for certain classes of vessels to run for more than a year before reinspection is required.

The Steamboat Inspection Service has continued to cooperate in forwarding cards showing the inspections of vessels as made by them.

Eight cases of typhoid fever on eight different boats were reported. None of these was attended by any unusual circumstances. Only 21 examinations of water from vessels were made this year

by cooperating city laboratories. Plans for one new vessel to be built by a shipbuilding company in this area were reviewed.

RAILWAY SANITATION

Continuing one of the projects started last year, reports on watering facilities and devices along the lines of the Western Maryland, Virginian, Baltimore & Ohio, and Norfolk & Western Railroads were completed and forwarded to the common carriers concerned. In addition a survey of the Atlantic Coast Line Railroad was started, but due to the lack of personnel was not completed during the year.

The district engineer continued as a member of the joint committee on railway sanitation of the American Railway Association and attended such meetings of that association as were called.

WATER SUPPLIES

The new scheme calling for the decentralization of the certification of common-carrier water supplies became effective in this district during the year. No difficulties were experienced in working out this plan, as is evidenced by the fact that all the States except one in this district had complete certification at the close of the calendar year. In Virginia a suggestion was made concerning the laboratory procedure which made the work there more effective. At the request of the Foreign Quarantine Division, tests were made of new wells at the quarantine station at Charleston, S. C., before the wells were accepted from the contractor. Similarly, at the request of the National Park Service, tests were made of new wells drilled at Yorktown, Va., where the Colonial National Monument is being established.

In company with officials of the Food and Drug Administration of the Department of Agriculture, the district engineer made calls upon the health officials of North Carolina, South Carolina, and Florida with reference to the question of bottled waters. This work was initiated by the Department of Agriculture, and the district engineer gave only such assistance as was found necessary.

COOPERATION WITH OTHER GOVERNMENT DEPARTMENTS

Assistance was given to the Commissioners of the District of Columbia in a survey of mosquito infestation until the 1st of August, when that work was removed from this station upon the transfer of Assistant Sanitary Engineer Robertson. A report on the investigation of the disintegration of a concrete intercepting sewer was transmitted to the District Commissioners during the year.

A survey was made of the Cherokee Indian Reservation at Cherokee, N. C., under the cooperative arrangement between this service and the Office of Indian Affairs. A complete report, with the necessary recommendations, was made after this investigation.

A number of trips was made to the Federal prison camp at Petersburg, Va., in connection with the procurement of a water supply, checking the quality of the procured water, the building and opera-

tion of the sewage-treatment plant, and the obtaining of a proper and adequate milk supply. Federal prison camps at Camp George G. Meade, Md., and at Fort Bragg, N. C., were also inspected and constructively criticized. Visits were made also to the Federal penitentiary at Atlanta, Ga., and the Federal Industrial Institution for Women at Alderson, W. Va. At both of these places contact was made with the medical officers in charge, in accordance with the new arrangement set up covering sanitation of these penitentiaries.

The National Park Service has been active at Washington's birth-place, Wakefield, Va., and at Yorktown, Va., in the establishment of new national monuments. Plans for a sewage-treatment plant at Wakefield were passed upon during the year. At Yorktown, where the Colonial National Monument is being laid out, it is intended to hold a sesquicentennial celebration in October of 1931. As a result, this office has cooperated with the National Park Service in working up sanitary measures both for the permanent monument and for the temporary celebration.

COOPERATION WITH STATE HEALTH DEPARTMENTS

Conferences were held and joint work done with all of the State health authorities and a number of visits were made to each State in this district.

The application of the Interstate Quarantine Regulations relative to the use of milk on interstate carriers was again brought to the front in connection with Asheville, N. C. It is interesting to note that, partly as a result of the application of these regulations, Asheville has adopted the United States Public Health Service standard milk ordinance.

A number of meetings of the State water and sewage-disposal groups were attended by the district engineer, although lack of personnel did not permit as much contact with these State units as is considered desirable.

TABULAR SUMMARY

Vessel water-supply supervision

Inspections:		Plans of vessel water systems examined:	
First inspections—		Approval granted.....	1
Passenger carrying.....	8	Approval withheld.....	0
Freight (only).....	4	Major conferences:	
Water boats.....	0	With shipping officials.....	3
Reinspections—		With others.....	0
Passenger carrying.....	76	Water examinations made:	
Freight (only).....	4	U. S. Public Health Service	
Water boats.....	9	laboratories.....	0
Certificates issued:		Other laboratories.....	21
Regular, favorable—		Typhoid fever cases reported:	
Passenger carrying.....	82	U. S. Public Health Service	
Freight (only).....	8	hospitals.....	8
Water boats.....	7	U. S. Public Health Service	
Regular, unapproved.....	1	quarantine stations.....	0
Temporary, favorable—		Health departments.....	0
Passenger carrying.....	2		
Freight (only).....	0		
Water boats.....	2		

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Railroad sanitation supervision

Inspections:		Water examinations made:	
Sources of water supply-----	0	U. S. Public Health Service	
Coach yards-----	0	laboratories-----	0
Terminals-----	0	Other laboratories-----	0
Watering points-----	0	Major conferences:	
Dining cars-----	0	With railroad officials-----	0
Certification:		With others (principally	
Data reports reviewed-----	236	health authorities)-----	1
Certificates prepared for			
States-----	319		

Shellfish sanitation supervision

Inspections:		State certificates—Continued.	
Areas-----	0	Canceled-----	71
Plants-----	171	Laboratory examinations made:	
State certificates:		U. S. Public Health Service	
Approved-----	345	laboratories-----	0
Not approved-----	0	Other laboratories-----	0
Approval withdrawn-----	0	Conferences-----	10

Miscellaneous

Cooperation with governmental agencies:		Cooperation with governmental agencies—Continued.	
Public Health Service—		Bureau of Prisons—	
Surveys-----	1	Surveys-----	8
Conferences-----	0	Conferences-----	10
Office of Indian Affairs—		State health departments—	
Surveys-----	1	Surveys-----	0
Conferences-----	2	Conferences-----	4
National Park Service—		Other governmental agencies—	
Surveys-----	0	Surveys-----	0
Conferences-----	4	Conferences-----	1

DISTRICT NO. 3.—OHIO, MICHIGAN, INDIANA, WISCONSIN, ILLINOIS, MINNESOTA, IOWA, NORTH DAKOTA, SOUTH DAKOTA, AND NEBRASKA

The activities of this district were continued under the direction of Sanitary Engineer Frank R. Shaw. This office was without an assistant sanitary engineer during almost the entire year, due to the death of Associate Sanitary Engineer Elliot H. Gage on July 13, 1930. Assistant Sanitary Engineer Robert W. Kehr, commissioned on June 23, 1931, reported for duty at this office on June 25.

The operations carried on comprised the following: (1) Inspection and supervision, for the purpose of certification, of the drinking and culinary water supplies and water-supply systems and general sanitary conditions on vessels operating in interstate traffic on the Great Lakes and the St. Lawrence River; (2) cooperation with the State health departments in the supervision of the water supplies used for drinking and culinary purposes on interstate common-carrier railroads, the method of loading the water on the trains, and the general sanitation of coach yards and terminals; (3) cooperation with the Department of Pensions and National Health of Canada relative to the sanitary control of drinking-culinary water supply sources and water systems on interstate and international carriers; (4) cooperation with other national governmental agencies, including the Indian Service of the Department of the Interior, the Coast

Guard and the Customs Service of the Treasury Department, the Supervising Architect's Office of the Treasury Department, and the Lighthouse Service of the Department of Commerce; (5) cooperation with the State health departments in matters involving sanitary engineering.

A tabular summary of the work appears at the end of this report.

VESSEL WATER SUPPLY AND SANITATION SUPERVISION

The supervision of vessel water supplies extended to 121 vessel companies and involved 64 passenger vessels and 432 freight vessels, a total of 496 vessels. A total of 345 inspections were made, 86 being on passenger vessels and 259 on freight vessels. The marked reduction in total inspections from 611 in 1929 and 539 in 1930 to 345 in 1931 was due to the necessity of assigning the engineering assistant to other work.

Twenty initial inspections were made, of which 3 were on passenger vessels and 17 on freight vessels. These inspections were on vessels launched during the year or recommissioned after two or more years of idleness rather than on active vessels not previously inspected.

Active interest and excellent cooperation on the part of the licensed officers and the vessel companies continued throughout the year. Several expressions of appreciation of the policies of this office have been received from the vessel companies and numerous favorable comments have been made by the licensed officers regarding the work.

The general improvement on the vessels and the effort of this office to bring all vessels under "Regular certificates" is illustrated in the following tabulation of the certification status:

Fiscal year	Temporary certificates	Regular certificates
1928.....	504	131
1929.....	422	280
1930.....	125	463
1931.....	69	483

A total of 2,109 samples of domestic water taken from vessels were examined bacteriologically by six city health departments. The reduction in the number of samples from 2,646 to 2,109 is due to the discontinuance of this cooperation by one city department, to another's taking far less samples, and to the lack of reports from the Canadian Provincial Department at Sault Ste. Marie. The plan of notifying the vessel companies of the results of bacteriological examinations by means of post cards immediately after the examinations are completed, inaugurated at the beginning of the 1929 season, has been continued.

The valuable assistance rendered by the steamboat inspectors of the Department of Commerce has continued. All offices continued to report the expiration date of the certificate found posted, making it possible for this office to insure that all vessels have active certificates. Fewer cases of failure to replace the preceding year's certificate by the new one were reported.

Vessel statistical data

Number of vessel companies in active file June 30, 1931.....	121
Number of passenger vessels.....	64
Number of freight vessels.....	432
Total vessels.....	496
Number of officers and seamen involved in crews.....	17,699
Number of vessels found without treatment apparatus and using raw lake water.....	0
Percentage of all vessels' samples conforming to Treasury standards:	
Calendar year 1928, 230 vessels.....per cent..	84.8
Calendar year 1929, 226 vessels.....do.....	87.6
Calendar year 1930, 196 vessels.....do.....	84.0

TYPHOID FEVER ABOARD VESSELS

The typhoid-fever statistics on cases reported by marine hospitals since 1915 are tabulated under statistical data. These statistics show a general trend downward from 70 in 1916 to 7 in 1930.

Typhoid fever among seamen on vessels operating in district No. 3

Navigation season	Cases	Navigation season	Cases	Navigation season	Cases
1915.....	60	1921.....	13	1927 ¹	10
1916.....	70	1922.....	17	1928 ²	11
1917.....	49	1923.....	25	1929.....	9
1918.....	39	1924.....	21	1930.....	7
1919.....	24	1925.....	7	1931.....	³ 1
1920.....	20	1926.....	29		

¹ Also 1 case of dysentery.² Also 3 cases of dysentery.³ Jan. 1 to June 30, 1931.

VENEREAL-DISEASE CONTROL AMONG SEAMEN

During 1929 this office cooperated with the Venereal Disease Division in its effort to induce the lake carriers of the Great Lakes to institute the full program suggested by the service for venereal-disease control among seamen. It is believed that the plan is still opposed by the majority of the companies and, as far as known, only two or three vessels carry prophylactic material, and only a few display warning signs. A great majority of the seamen from whom opinions have been solicited are strongly in favor of the full plan. The data tabulated hereinafter indicate that the disease continues to increase.

Venereal disease among seamen applying for treatment at the Chicago outpatient office of the Public Health Service

	Calendar year 1928	Fiscal year 1930	Fiscal year 1931
New venereal-disease cases.....	312	598	630
Total venereal-disease treatments.....	2,333	2,115	1,890
Total treatments, all causes.....	5,889	4,505	4,641

RAILROAD WATER SUPPLY AND GENERAL SANITATION

The plan whereby this office reviews the data reports on railroad water-supply sources submitted by the State health departments and prepares the certificates for the State health officer's signature was continued. Two of the States in this district, Minnesota and Illinois, elected to continue to prepare the certificates, but all the papers were forwarded through the district engineer's office. During the fiscal year 488 data reports were reviewed and 422 certificates were prepared by this office for the States.

The Detroit City Health Department continued to collect and examine samples of water taken from the tanks and coolers on coaches, Pullman cars, and diners. A total of 1,602 samples were taken and reported upon this year. The results suggest that improvement in coach-yard sanitation is needed.

The inspection of dining cars was extended so far as possible. Since 174 diners, practically the entire number entering Chicago, were inspected during the latter part of the last fiscal year, an effort was made by the engineering personnel when traveling to inspect such diners as do not enter Chicago. Eight diners were inspected.

Nine coach-yard inspections were made during the year.

COOPERATION WITH FEDERAL AGENCIES

Office of Indian Affairs.—Cooperation with the Office of Indian Affairs on matters of sanitary engineering continued during the year. Surveys were made by this office at two additional field administrative units. Thus far a total of 21 of the 28 administrative units have been visited. Through cooperation with the district engineer, the State sanitary engineer of Michigan surveyed and reported upon the sewage-disposal situation at Mount Pleasant and the State sanitary engineer of Minnesota surveyed and reported upon the water supply, sewage disposal, and milk sanitation at two units of the Consolidated Chippewa Agency in Minnesota.

Many of the reservations continued to submit samples of the domestic water supply and the milk supply to the State laboratories for bacteriological examination, as recommended by this office. Copies of the results were forwarded to this office for review. It is interesting to note that the early samples on all milk supplies showed high bacterial counts; but with prompt correction of general sanitation, all supplies from which samples have been submitted have had counts of less than 50,000 per cubic centimeter.

As a result of our recommendations, plans, and specifications, the following constructive sanitary engineering was accomplished or started during the fiscal year: (1) Standard chlorinators at the Keshena Agency and the Sac and Fox Sanatorium; (2) gravity pipe line to Lake Keshena at the Keshena Agency; (3) sewerage system and extensive treatment works at the Rosebud Agency and Hospital; (4) sewerage system extensions at the Fort Totten, Turtle Mountain, and Crow Creek Agencies; (5) water-supply development at Fort Totten; (6) steel elevated tank and centrifugal pump at the Flandreau School; (7) specifications for and advisory supervision of the construction of the sewage-treatment plant at Lac du

Flambeau; (8) water-supply development at the Genoa School; (9) unsuccessful attempt to develop a deep-well water supply at Neopit under guaranteed contract followed by beginning of the plans for a purification plant.

In addition, recommendations were forwarded regarding the water supplies and sewage disposal for Mount Pleasant, Rapid City, and the Consolidated Chippewa Agencies.

Coast Guard Service.—Following a special request, a survey was made of the water supply serving the Coast Guard station at Cleveland.

Supervising Architect's Office.—As requested by the Office of the Supervising Architect, surveys were made of proposed sites for border stations at Ambrose, N. Dak.; Noyes, Minn.; Pembina, N. Dak.; and Portal, N. Dak. Recommendations were made regarding water supplies and sewage disposal.

Lighthouse Service.—During December the Commissioner of Lighthouses requested the Surgeon General to have inspections made of the Lighthouse Service vessels in the twelfth district (Lake Michigan). Detailed inspections were made during January and February, and complete descriptive and graphic reports were prepared and forwarded. The desirability of providing a domestic water as clear and as palatable as the water taken directly from overboard in midlake, the necessity for conservation of space, and the advisability of economy led this office to decide upon chlorination by means of a calcium-hypochlorite solution, followed by dechlorination by means of activated carbon. The study of pump rates and space available resulted in the development of a simple device, consisting of standard laboratory equipment, costing about \$20. Subsequent recommendations called for making the dechlorinating filter of flanged pipe filled with granular activated carbon and arranged for upward flow. As the fiscal year closed, arrangements were made for making one such installation and the determination of its efficiency.

The superintendent of the twelfth district also requested that surveys be made of the water supplies and sewage-disposal facilities at airway weather stations. Five of the ten stations were surveyed during the fiscal year.

TABULAR SUMMARY

Vessel water-supply supervision

Inspections:		Plans of vessel water systems examined:	
First inspections—		Approval granted-----	4
Passenger carrying----	3	Approval withheld-----	0
Freight (only)-----	17	Major conferences:	
Water boats-----	0	With shipping officials----	3
Reinspections—		With others-----	9
Passenger carrying----	83	Water examinations made:	
Freight (only)-----	242	U. S. Public Health Service laboratories-----	0
Water boats-----	0	Other laboratories-----	2,109
Certificates issued:		Typhoid-fever cases reported:	
Regular, favorable—		U. S. Public Health Service hospitals-----	6
Passenger carrying----	67	U. S. Public Health Service quarantine stations----	0
Freight (only)-----	416	Health departments-----	0
Water boats-----	0		
Regular, unapproved-----	0		
Temporary, favorable—			
Passenger carrying----	13		
Freight (only)-----	56		
Water boats-----	0		

Railroad sanitation supervision

Inspections:		Water examinations made:	
Source of water supply-----	0	U. S. Public Health Service laboratories-----	0
Coach yards-----	9	Other laboratories-----	1,602
Terminals-----	0	Major conferences:	
Watering points-----	0	With railroad officials-----	0
Dining cars-----	8	With others (principally health authorities)-----	22
Certification:			
Data reports reviewed-----	488		
Certificates prepared for States-----	422		

Miscellaneous

Cooperation with governmental agencies:		Cooperation with governmental agencies—Continued.	
Public Health Service—		Lighthouse Service—	
Surveys-----	0	Vessel inspections-----	8
Conferences-----	3	Conferences-----	4
Office of Indian Affairs—		Airway weather stations—	
Surveys-----	8	Water-supply surveys--	5
Conferences-----	14	Sewage-disposal surveys-----	4
Supervising Architect's Office—		State health departments—	
Surveys-----	4	Surveys-----	0
Conferences-----	4	Conferences-----	1

DISTRICT NO. 4.—ALABAMA, MISSISSIPPI, MISSOURI, LOUISIANA, OKLAHOMA, ARKANSAS, KANSAS, KENTUCKY, TEXAS, AND TENNESSEE

The district activities were under the direction of Sanitary Engineer H. N. Old, with the exception of the first two months of the fiscal year, during which time Mr. Old was on temporary duty at Washington. Past Assistant Sanitary Engineer E. C. Sullivan assisted in the performance of district duties during the first half of the fiscal year, but was on temporary duty in Districts Nos. 1 and 2 from January 5 until after June 30.

The activities consisted chiefly of (1) certification of interstate carrier water-supply sources in cooperation with the States; (2) supervision of handling, storage, and distribution of drinking and culinary water on railway equipment and vessels; (3) investigation of typhoid-fever cases reported by stations of the Public Health Service; (4) supervision of shellfish sanitation in cooperation with the States; (5) surveys and consultant service with various Federal agencies, such as the Office of Indian Affairs of the Interior Department and the Bureau of Prisons of the Department of Justice; and (6) other allied sanitary-engineering duty.

SUPERVISION OF INTERSTATE CARRIER WATER-SUPPLY SOURCES

Within the 10 States comprising this district there are over 700 water-supply sources used by common carriers engaged in interstate traffic. Every effort has been made by this station to facilitate the reporting of these sources by the respective State health departments, and to this end surveys are made by personnel of the district office upon the request of the States in so far as possible.

During the fiscal year 1931 survey data reports on 728 supplies were reviewed and 1,126 certificates, prepared on the basis of these reports, were forwarded to the State health officers for signature and transmitted to the Public Health Service.

Fourteen surveys were made by district personnel in Arkansas and Texas. It is encouraging to note that the percentage of total supplies acted upon is increasing each year and that most of the States within the district are putting forth every effort to attain 100 per cent in this rating.

During the calendar year 1930 the 10 States of the district reported upon slightly over 90 per cent of the supplies.

SUPERVISION OF RAILROAD WATER-SUPPLY EQUIPMENT

Most of the States feel that the Public Health Service is the responsible agency in the supervision of railway coach-yard and terminal sanitation, particularly in the matter of handling, storing, and distributing the drinking water from the tap to the passenger. This responsibility in a large measure has been accepted by this district, and 181 inspections and reinspections have been made during the fiscal year. These have included the following points: Birmingham, Mobile, and Montgomery, Ala.; Little Rock, Ark.; Covington and Louisville, Ky.; Alexandria, Baton Rouge, and New Orleans, La.; Gulfport, Jackson, and Vicksburg, Miss.; St. Louis, Mo.; Oklahoma City, Okla.; Chattanooga, Memphis, and Nashville, Tenn.; Beaumont, Dallas, Fort Worth, Galveston, Houston, Paris, and Texarkana, Tex. These surveys have involved all of the larger railway systems among the 122 rail carriers operating within the district. Vastly improved conditions in the matter of hydrant boxes, hose lines, storage and sterilizing facilities, and general operation were noted over conditions of several years ago.

Some time was devoted to the sanitary supervision of parking of occupied Pullman cars at the Mardi Gras in New Orleans, the Derby Day event at Louisville, and the Confederate Veterans' Reunion at Montgomery. In all but one instance at Louisville very hearty cooperation was shown by the carriers in measures to prevent contamination of drinking water.

This activity was held somewhat in abeyance during the last few months of the fiscal year in contemplation of the issuance at an early date of the final report of the joint committee on railway sanitation of the American Railway Association.

The sanitary engineering bureau of the Texas State Department of Health has recently demonstrated an interest in coach-yard and terminal sanitation, so that such sanitary supervision in Texas has been taken over by the State, with the Public Health Service acting in an advisory capacity.

During inspection of dining cars, particular attention was paid to the source of milk and shellfish used. This has resulted in the adoption of pasteurization of milk served by several of the transportation companies.

SUPERVISION OF VESSEL DRINKING-WATER SYSTEMS

Amenable to the United States Interstate Quarantine Regulations and operating within the jurisdiction of this district at the close of the fiscal year were 53 major vessel companies operating 28 passenger-carrying and 98 freight vessels, in addition to which were 12 smaller companies operating 18 ferries and similar small craft. Due to economic conditions and diligence in eliminating vessels not actually engaged in interstate traffic, there was a reduction from last year.

Some of these small vessels are operating at remote locations on the Mississippi and Ohio Rivers and are therefore difficult to reach annually. The larger and more important carriers, particularly those engaged in passenger traffic, are inspected annually in order to determine their fitness for favorable certification of the drinking and culinary water supply systems. The temporary certificates formerly issued on the basis of vessel masters' statements in lieu of inspection are being replaced rapidly by regular certificates following inspection and correction of violations found.

Of the 144 district vessels, 86 were under regular and 36 under temporary certificates at the close of the fiscal year, with 22 others holding no certificates.

In the case of 65 vessels, distillation apparatus was used in treating overboard water for drinking and culinary purposes, while the remaining 79 vessels used approved shore supplies without further treatment, 29 of which supplies are located within the district, while 21 are located in other interstate sanitary districts.

Most of the violations comprise failure to provide proper warning signs over taps supplying nonpotable water, existence of uncovered storage barrels for emergency supply, presence of an occasional cross connection between the safe water supply and the overboard supply, and failure to provide and properly maintain special hose for filling tanks.

In many instances plans of new vessels to be operated in the district are secured from the builders, and any changes necessary to place the drinking and culinary water systems in compliance with regulations are called to the attention of the owners and builders by the Public Health Service.

It has been found that the small 1-vessel companies are more difficult to deal with than the larger companies, although excellent cooperation has been received from the majority of operators in the district.

At the request of the chief engineer of the Mississippi-Warrior Service, 8 or 10 representative Federal Barge Line express and tow boats were thoroughly surveyed with respect to drinking and culinary water facilities. Detailed reports were furnished outlining exactly what requirements would have to be met if these vessels were amenable to the Federal regulations. It is understood that these recommendations are being adopted as rapidly as possible.

The Cincinnati City Health Department continued to forward regularly reports of analyses of vessel drinking-water samples. Several other inland river cities submitted a few such reports. It is interesting to note that in only 19 samples of a total of 416 was there found evidence of colon bacillus in 10 cubic centimeter portions.

TYPHOID-FEVER CASES ON VESSELS

During the year 18 typhoid-fever cases were reported from marine hospitals within the district. These patients are classed as to origin as follows: United States Engineer Corps (Army), 8; Federal Barge Line, 3; interstate carriers,¹ 4; local or harbor vessels, 3.

¹ In 3 of these cases the vessels, while classed as interstate carriers, had been engaged in local excursion trade at New Orleans and Cincinnati for several months previous to the occurrence of the cases.

It will be noted that nearly half of the cases were among civilian employees of the United States Engineer Corps, being distributed as follows: St. Louis, 5; Memphis, 2; and Port Arthur, 1.

As a result of the investigation at Memphis it was learned that three other cases, all within 30 days, had been hospitalized elsewhere. At the request of the district engineer of the War Department a complete survey was made of sanitation on all floating equipment of the district and detailed report with recommendations submitted. While the investigation, made about 50 or 60 days after the start of the outbreak, could not be expected to establish the cause definitely, it did show grossly defective facilities for the treatment and storage of drinking and culinary water on board some of this equipment.

Between May 15 and June 15 five typhoid cases reported by the St. Louis Marine Hospital among United States Engineer Corps personnel were investigated, and from the description of water-supply facilities as given by these patients the conditions seemed very similar to those at Memphis.

SHELLFISH SANITATION

The oyster-producing areas of Alabama, Mississippi, Louisiana, and Texas were thoroughly investigated between 1925 and 1928, when bacteriological and sanitary surveys were conducted by the States and the Public Health Service. Since that time there has been little or no change in so far as potential pollution of the areas is concerned. Therefore only a limited amount of resurvey is done each year. Alabama studied its more important areas in September, 1930, but found conditions unchanged.

Due to the relative safeness of practically all of the producing areas within the district, the greatest concern is that of shore storage, shucking, and packing.

On account of the loss in September of the assistant sanitary engineer who had been supervising shellfish sanitation during the past few years in Mississippi, the Public Health Service agreed to render all possible assistance in the emergency. Therefore, most of the Mississippi inspections until January were made by Public Health Service personnel. Some of the main difficulties among the dealers in this State have been the use by uncertified dealers of cans bearing valid certificate numbers, purchase of shucked stock from unapproved sources, and the shucking of oysters on reefs in the Gulf. This practice is encountered at the opening of each season.

While Texas certified to the Public Health Service two shucking and packing plants, the production from this State to other States is believed to be quite small. For this reason not as much attention was devoted to Texas shellfish sanitation by the Public Health Service as would otherwise have been the case.

The Public Health Service, in a general sense, continued to act as an intermediary between the producing and consuming States of the district in matters of shellfish sanitation by advising the State health authorities and coordinating their efforts.

There is given below a tabular summary of shellfish sanitation supervision within the district.

State	State certificates approved	Plant inspection by State personnel	Plant inspection by U. S. Public Health Service personnel
Alabama.....	38	274	106
Louisiana.....	40	309	136
Mississippi.....	42	195	203
Texas.....	2	6	0
Total.....	122	784	445

COOPERATION WITH BUREAU OF INDIAN AFFAIRS

With the sanitary surveys made at the Haskell Institute and the Potawatomie Subagency in Kansas in June, all of the 25 Indian Bureau jurisdictions within the district have been visited and preliminary surveys completed.

Several of the jurisdictions were revisited for the purpose of special investigations, chiefly for the purpose of consultation and advice on water-supply problems. Several of these were the result of the drought situation, felt so keenly in eastern Oklahoma late in 1930 and early in 1931. This condition was particularly acute at the Jones Academy at Hartshorne, Okla., and the Sequoyah Orphan Training School at Tahlequah, Okla.

The Pawnee Agency at Pawnee, Okla., the three Osage villages in the vicinity of Pawhuska, Okla., and Wheelock Academy at Millerton, Okla., were revisited for the purpose of following up previous recommendations, most of which had been adopted.

Two visits to the Haskell Institute were made largely for the purpose of investigating the efficiency of operation of the modified activated-sludge sewage-treatment plant constructed two years ago.

COOPERATION WITH FEDERAL BUREAU OF PRISONS

During the year two visits were made to the Federal penitentiary at Leavenworth, Kans., in connection with a matter of sewage disposal in which the States of Kansas and Missouri were involved. Conferences were held with penitentiary officials and the State sanitary engineers concerned. During these visits consultant advice was given also concerning mosquito-control measures and other matters of sanitation. The opportunity was taken to observe the result of recommendation made at this institution two years ago, following a detailed sanitary survey. Many of the suggested improvements had been made.

Two Federal prison camps established during the year at Maxwell Field, Montgomery, Ala., and Fort Riley, Kans., were visited and sanitary surveys made at each location. Both of these camps are located on military reservations and consequently have the advantage of satisfactory water supply and sewage-disposal facilities. Recommendations were made concerning several minor conditions which could be improved advantageously.

MISCELLANEOUS ACTIVITIES

Among the miscellaneous district activities were (1) attendance of station personnel at the conference of State sanitary engineers, and the sanitary engineering section meetings of the American Public Health Association at Fort Worth, Tex., in October; and (2) several sessions of the National Food and Drugs Officials' Convention at New Orleans, La., in November.

Papers on water supply and treatment were prepared by the district engineer and read at the Texas waterworks short school at Waco, Tex., in January and the Oklahoma waterworks short school at Stillwater, Okla., in April.

Frequent conferences were held throughout the year with the various State sanitary engineers and State health officers concerning cooperative activities in which the States and the Public Health Service are mutually interested.

TABULAR SUMMARY

Vessel water-supply supervision

Inspections:		Plans of vessel water systems examined:	
First inspections—		Approval granted-----	3
Passenger carrying----	48	Approval withheld-----	0
Freight (only)-----	103	Major conferences:	
Water boats-----	0	With shipping officials----	48
Reinspections—		With others-----	6
Passenger carrying----	28	Water examinations made:	
Freight (only)-----	42	U. S. Public Health Service	
Water boats-----	1	laboratories-----	0
Certificates issued:		Other laboratories-----	416
Regular, favorable—		Typhoid fever cases reported:	
Passenger carrying----	45	U. S. Public Health Service	
Freight (only)-----	49	hospitals-----	18
Water boats-----	0	U. S. Public Health Service	
Regular, unapproved-----	0	quarantine stations-----	0
Temporary, favorable—		Health departments-----	0
Passenger carrying----	35		
Freight (only)-----	44		
Water boats-----	0		

Railroad sanitation supervision

Inspections:		Water examinations made:	
Sources of water supply---	12	U. S. Public Health Service	
Coach yards-----	115	laboratories-----	0
Terminals-----	62	Other laboratories-----	3
Watering points-----	4	Major conferences:	
Dining cars-----	13	With railroad officials----	23
Certification:		With others (principally	
Data reports reviewed-----	728	health authorities)-----	18
Certificates prepared for			
States-----	1,126		

Shellfish sanitation supervision

Inspections:		State certificates—Continued.	
Areas-----	0	Canceled-----	16
Plants-----	445	Laboratory examinations made:	
State certificates:		U. S. Public Health Service	
Approved-----	122	laboratories-----	0
Not approved-----	6	Other laboratories-----	0
Approval withdrawn-----	0	Conferences-----	20

Miscellaneous

Cooperation with governmental agencies:		Cooperation with governmental agencies—Continued.	
Office of Indian Affairs—		Other governmental agencies—	
Surveys.....	10	Surveys.....	1
Conferences.....	7	Conferences.....	3
Bureau of Prisons—			
Surveys.....	3		
Conferences.....	3		

DISTRICT NO. 5.—ARIZONA, CALIFORNIA, COLORADO, NEW MEXICO, NEVADA, AND UTAH

DISTRICT NO. 6.—IDAHO, MONTANA, OREGON, WASHINGTON, AND WYOMING

The engineering personnel assigned to these two districts during the fiscal year was as follows: Sanitary Engineer H. B. Hommon, in charge; Passed Assistant Sanitary Engineer A. L. Dopmeyer; Assistant Sanitary Engineer O. C. Hopkins.

The activities of the engineers at this station were as follows: (1) Vessel inspections and interstate water supplies; (2) sanitation in national parks and monuments; (3) sanitation on Indian reservations; (4) water supplies, sewerage, and sewage disposal at proposed customs and immigration inspection stations; (5) preparation of plans for laboratory at San Francisco; (6) miscellaneous activities.

VESSEL WATER SUPPLY AND SANITATION SUPERVISION

The work done in connection with inspections of vessel water-supply systems and sanitation of vessels was carried on by one sanitary engineering assistant, and the time devoted to the field and office work was approximately four and one-half months. During the calendar year 254 inspections were made, and 215 regular and 74 temporary certificates were issued. Three cases of typhoid fever among seamen were reported from marine hospitals.

As a general rule, officials of vessel companies have willingly carried out recommendations made for improving the water-supply systems on their vessels, and when corrections have been made they have been, as a rule, permanent. However, one company, owning several vessels constructed many years ago, reported that they could not make any changes in their water-supply systems without automatically bringing their vessels within the Steamboat Inspection Service laws, which are not retroactive except when repairs of a certain nature are made. This situation brought up the question as to whether the Public Health Service law was effective from date of passage or was retroactive. The local representatives of the Steamboat Inspection Service and the officials of the vessel companies had the impression that our law is not retroactive, but a recent bureau ruling states that the law governing the vessel water-supply systems applies to all vessels in interstate traffic regardless of the dates vessels went into service.

RAILROAD WATER SUPPLY AND SANITATION SUPERVISION

An active campaign was carried on during the year to increase the number of railroad water supplies certified. In Nevada and Wyoming, where there are no sanitary engineers, service engineers made surveys of 13 and 14 supplies, respectively, and in other States of the 2 districts 46 supplies were surveyed.

Progress was made toward enforcement of the recent bureau ruling regarding elimination or protection of cross connections. State sanitary engineers, mainly through personal interviews, submitted more complete survey reports than formerly.

COOPERATION WITH STATE AND CITY HEALTH DEPARTMENTS

Conferences were held with State health officers or State sanitary engineers of 10 of the 11 States of the 2 districts, and with waterworks officials of many cities and towns. Experience during the past year in handling the railroad and vessel water supplies under the present method of certification indicates that in our two districts the decentralization plan is more satisfactory than the previous arrangement.

SANITATION IN THE NATIONAL PARKS AND MONUMENTS

General.—The activities carried on in connection with sanitation in the national parks and monuments, other than those that will be discussed under each park and monument separately, were as follows: (1) Preparation of plans for a garbage incinerator that uses oil for fuel in place of wood and has several improvements over the original design; (2) attendance at a conference of field officers of National Park Service and public operators in parks, held in Washington, D. C.; (3) conferences in four national parks to discuss general plans for developments involving various problems of sanitation; and (4) cooperation with chief civil and landscape engineers and fire-prevention expert of the Park Service regarding the design and construction of waterworks, sewage-disposal plants, and garbage incinerators.

The routine work carried out in all the parks and monuments visited included general inspections of all hotels, lodges, cafeterias, housekeeping units, swimming pools, and other places handling, selling, or serving food products, and inspections of Government automobile tourist camps and other operations of the Government in the parks where problems of sanitation are involved.

The parks where only routine inspections were made are Crater Lake, Grand Teton, Wind Cave, Rocky Mountain, Zion, Bryce Canyon, General Grant, and Platt. The activities in the other parks visited were as follows:

Carlsbad National Park.—Recommendations were made for increasing the water supply during the current year and plans for an entirely new supply were reviewed. Estimates were prepared for a water-softening plant and for an extension of the sewer system and for a sewage-treatment plant.

Glacier National Park.—Plans were prepared for a screen and grit chamber for water supply at Many Glacier camp grounds and hotel, and recommendations were given regarding installation of water-supply and sewerage systems for the camp grounds.

Grand Canyon National Park.—Plans were prepared for a sewage-disposal plant for the camp grounds at Rowe Well, and the plans submitted by the Santa Fe Railroad Co. for a pumping plant and pipe line for pumping water from Indian Gardens to the South Rim, a vertical distance of approximately 3,300 feet, were reviewed.

Lassen Volcanic National Park.—Complete plans with bill of materials and specifications were submitted for a concrete water-storage tank and distribution system, and a sewerage system and disposal plant for headquarters area at Mineral, and for a screen and grit chamber and water-supply line at Manzanita Lake.

Mount Rainier National Park.—Plans, bill of materials, and specifications were prepared for a sewage-disposal plant for Longmire, and specifications were submitted for a baling machine to bale waste tin cans.

Pinnacles National Monument.—Estimates were prepared for a new water-supply system and a sewerage system and disposal plant.

Platt National Park.—Plans for development of Black Sulphur Springs were reviewed and recommendations were submitted for general improvements to the other springs in the park. The final plans submitted by the town of Sulphur for a disposal plant to treat the sewage from the town, and Government buildings were reviewed and recommendations given regarding the design of this plant.

Sequoia National Park.—Estimates were submitted for a water-supply, sewerage system, and disposal plant for the Lodgepole camp grounds, and recommendations were given for extension of the water-supply system for Giant Forest and Ash Mountain headquarters. Estimates were also prepared for a water-softening plant for headquarters area.

Yellowstone National Park.—Plans were submitted for a sewage-disposal plant for Mammoth Hot Springs and Fishing Bridge Junction. Plans were prepared for a screen chamber for the combined water-power and domestic water-supply pipe line for Mammoth Hot Springs, and data were furnished for the installation of the pipe line. Plans were also submitted for two garbage incinerators.

Yosemite National Park.—In 1930 plans for a sewage-treatment plant for the floor of the valley were prepared by district engineers, and assistance was given in the preparation of plans for approximately 4 miles of sewer lines. Construction work was carried on by force account throughout the fiscal year of 1931. Bills of materials and specifications were prepared by district engineers for all equipment, materials, and sewer pipe used in the construction of the treatment plant and sewer system, and many visits were made to the park for the purpose of consulting with the local engineers regarding the construction of the sewer line and treatment plant and the installation of equipment. The total cost of the two projects was approximately \$175,000, and they were completed and ready to use, except for waterproofing, on June 30, 1931. The sewer system consists of 20-inch vitrified pipe, and the treatment plant includes a

presettling tank, aeration tank, clarifiers, covered sludge-digestion tanks with gas-recovery equipment, glass-covered sludge beds, and full automatic chlorine machine for applying liquid chlorine to the treated sewage in proportion to the flow of the effluent.

Plans were submitted for a water-settling tank for water supply at Tuolumne Meadows, and data were furnished for installation of water-supply systems, sewerage systems, and disposal plants for Tuolumne Meadows and Mariposa Grove.

The daily volume of sewage produced on the floor of the valley was computed from charts, and an average of five samples of water per week from the domestic supply and the Merced River were analyzed at the Federal laboratory for *B. coli* and the results tabulated.

COOPERATION WITH OFFICE OF INDIAN AFFAIRS

The work done in connection with sanitation on Indian reservations included field trips to the agencies, subagencies, schools, hospitals, and other places listed below and preparation of general reports and bills of materials, estimates, and plans for improvements recommended.

Arizona:

Southern Navajo Agency (2).²
 Maricopa Day School and Sub-agency.
 Leupp Indian Agency.
 Western Navajo Agency.
 Fort Defiance Agency.
 Theodore Roosevelt School (2).
 Sells Indian Agency.
 San Xavier Day School and Sub-agency.
 San Carlos Indian Agency.

Nevada: Walker River Indian Agency.

Montana:

Fort Belknap Indian Agency (2).
 Blackfeet Indian Agency.

Wyoming:

Crow Indian Agency.
 Tongue River Indian Agency.
 Shoshone Indian Agency.

Idaho: Fort Hall Indian Agency (2).
 Colorado: Consolidated Ute Agency (2).

New Mexico:

Charles H. Burke Indian School.
 Jicarilla Indian Agency (3).
 Eastern Navajo Agency.
 Laguna Sanatorium.
 Northern Pueblo Agency and sub-agencies at Santa Clara, Taos, Tesuque, Picuris, San Ildefonso, and San Juan.
 Southern Pueblo Agency and sub-agencies at Acoma, Laguna, Chicole, McCartys, Isleta, Paraje, and Scama.
 Mescalero Indian Agency.
 Nava Day School and Subagency.
 Washington: Tacoma Hospital (2).
 Oregon: Salem Indian School.

COOPERATION WITH SUPERVISING ARCHITECT'S OFFICE

Field surveys were made at proposed border inspection stations at Sweetgrass and Roosville, Mont.; Metaline Falls, Oroville, and Sumas, Wash.; Douglas, Ariz.; and San Ysidro and Tecate, Calif. A service engineer from districts 5 and 6, assigned to district No. 3, made surveys at Pembina and Ambrose, N. Dak., and Noyes, Minn. Plans, bills of materials, and specifications were prepared for water supplies and sewage disposal for the inspection stations given above and for water-supply and sewerage systems and sewage disposal for the Babb-Piegan station in Montana.

SHELLFISH SANITATION

Practically all the shellfish produced on the Pacific coast come from the State of Washington. Surveys of all the growing areas

² Figures in parentheses indicate number of field trips made to the agency or subagency.

were made and the shucking and packing houses were inspected. The general sanitary conditions at the growing areas and in the shucking and packing houses were very satisfactory.

COOPERATION WITH DEPARTMENT OF JUSTICE

A survey of the water and milk supplies and sewerage and sewage disposal at the prison camp, Fort Lewis, Wash., was made.

MISCELLANEOUS

1. Service engineers presented papers at the annual meetings of the Montana section, American Water Works Association, and the western branch of the American Public Health Association.

2. Plans were prepared under the direction of Medical Director J. C. Perry for a laboratory at San Francisco.

3. By request of the director of the National Park Service, the district engineer attended a conference of field officers of the park service in Washington and cooperated with engineers of the park service in getting out estimates for a water supply, sewerage, and sewage and garbage disposal for the Colonial National Monument and for the sesquicentennial to be held at Yorktown, Va., in October, 1931. The district engineer also reviewed plans for water supply, sewerage, and sewage disposal for the George Washington Memorial birthplace, which later will be created a national monument.

4. A map was prepared showing the domestic and fire service water lines at the United States quarantine station, Angel Island, Calif., and specifications were submitted for a water softener for the domestic supply, and following installation tests of softener were made.

5. Inspections of 24 dining cars were made during the year.

6. A large number of chemical analyses of samples of water from national parks and monuments, Indian reservations, United States customs and immigration inspection stations, and other Government agencies were made.

TABULAR SUMMARY

Vessel water-supply supervision

Inspections:		Plans of vessel water systems examined:	
First inspections—		Approval granted.....	0
Passenger carrying.....	28	Approval withheld.....	0
Freight (only).....	34	Major conferences:	
Water boats.....	0	With shipping officials.....	5
Reinspections—		With others.....	0
Passenger carrying.....	156	Water examinations made:	
Freight (only).....	123	U. S. Public Health Service	
Water boats.....	0	laboratories.....	0
Certificates issued:		Other laboratories.....	0
Regular, favorable—		Typhoid-fever cases reported:	
Passenger carrying.....	151	U. S. Public Health Service	
Freight (only).....	143	hospitals.....	0
Water boats.....	0	U. S. Public Health Service	
Regular, unapproved.....	0	quarantine stations.....	1
Temporary, favorable—		Health departments.....	0
Passenger carrying.....	70		
Freight (only).....	31		
Water boats.....	0		

Railroad sanitation supervision

Inspections:		Water examinations made:	
Sources of water supply-----	86	U. S. Public Health Service	
Coachyards-----	0	laboratories-----	116
Terminals-----	0	Other laboratories-----	0
Watering points-----	0	Major conferences:	
Dining cars-----	24	With railroad officials-----	11
Certification:		With others (principally	
Data reports reviewed-----	255	health authorities)-----	30
Certificates prepared for			
States-----	320		

Shellfish sanitation supervision

Inspections:		State certificates—Continued.	
Areas-----	4	Canceled-----	0
Plants-----	14	Laboratory examinations made:	
State certificates:		U. S. Public Health Service	
Approved-----	2	laboratories-----	0
Not approved-----	0	Other laboratories-----	0
Approval withdrawn-----	0	Conferences-----	4

Miscellaneous

Cooperation with governmental agencies:		Cooperation with governmental agencies—Continued.	
Public Health Service—		Bureau of Prisons—	
Surveys-----	4	Surveys-----	1
Conferences-----	5	Conferences-----	1
Office of Indian Affairs—		Supervising Architect's Office—	
Surveys-----	45	Surveys-----	11
Conferences-----	17	Conferences-----	4
Bacteriological analyses, water-----	40	State health departments—	
National Park Service—		Surveys-----	1
Surveys-----	27	Conferences-----	3
Conferences-----	40		
Bacteriological analyses, water-----	231		

REPORT ON THE WORK OF MOSQUITO CONTROL IN THE DISTRICT OF COLUMBIA

This office was established on August 1, 1930, under the direction of Sanitary Engineer R. E. Tarbett. Coordination and supervision of the activities of the several control organizations and administrative details of the office were carried out by Assistant Sanitary Engineer J. L. Robertson. Sanitary Engineer H. N. Old was attached to the office from July 21 to August 16 in an advisory capacity.

ACTIVITIES

The activities of this office were started on August 1. Prior to that time, during the period from July 18 to July 31, inclusive, Mr. Robertson, who was then attached to Interstate Sanitary District No. 2, was engaged in preliminary mosquito surveys. The plan for control measures, as recommended in a report by Sanitary Engineer R. E. Tarbett, dated November 5, 1929, was followed throughout the year. Under this plan general supervision and coordination of

the activities were carried on by the Public Health Service, while the actual control work was performed by the District of Columbia sewer department, the Office of Public Buildings and Public Parks, the District of Columbia Health Department, and the following other Federal and District agencies:

District Government:	War Department—Continued.
National Training School for	Walter Reed Hospital.
Girls.	Department of Commerce:
Gallinger Hospital and Jail.	Bureau of Standards.
Home for the Aged and Infirm.	Navy Department:
Public school grounds.	Navy Yard.
Tuberculosis Hospital.	Naval Air Station.
Department of the Interior:	Naval Hospital.
St. Elizabeths Hospital.	Naval Observatory.
Columbian Institute for the Deaf.	Arlington Wireless Station.
Department of Agriculture:	Naval Laboratory.
Agricultural experimental farm.	Naval Magazine.
Greenhouses on the Mall.	Department of Justice:
War Department:	National Training School for
War College.	Boys.
Bolling Field.	Engineer Department:
Arlington Cemetery.	Dalecarlia Filtration Plant.
Fort Myer.	McMillan Filtration Plant.
Soldiers' Home.	Miscellaneous agencies:
Soldiers' Home Cemetery.	Botanic Gardens.

Arrangements were made with a large number of independent agencies to have control measures carried on in their territories and buildings by one of the control organizations. It was also arranged between the control organizations that they should exchange small outlying areas where treatment could be accomplished more easily by one than by the other. This made for more effective control and facilitated the work, eliminating the overlapping of activities.

Plans for control measures and designs of necessary equipment were furnished to the control organizations. The superintendents of these organizations were conferred with frequently and instructed concerning methods of control and familiarized with mosquito life and habits.

Unusual weather conditions were encountered during the year. During the summer months of 1930 precipitation was below normal and certain stream areas were dry, but, on the other hand, the large free-running streams pooled, and prolific breeding places were formed. In the spring of 1931 frequent rains were encountered and numerous pools were formed in the wooded sections. Because of these abnormal conditions emergency measures had to be taken and no well-defined program could be followed, with the exception of the catch-basin-oiling activities.

The prevalence of mosquitoes at the Executive Mansion and in the Mall and Potomac Park areas led to the discovery of large breeding areas on Columbia Island, situated on the Virginia side of the Potomac River. The United States Engineer Department had constructed a dike around the island and was carrying on hydraulic filling operations.

A survey was made of the District of Columbia and vicinity from September, 1930, to February, 1931, inclusive. Data obtained were forwarded to the several interested agencies, with recommendations for control measures for the season beginning in April, 1931. Ques-

tionnaires were sent to the smaller agencies requesting information as to the number of catch basins, fountains, and other water receptacles on their properties. Upon receipt of this information the District of Columbia sewer department was requested to supply these various agencies with oil for use in potential breeding places. When necessary, other methods of control were recommended.

The control organizations started stream-cleaning operations in March, preparatory to the 1931 season. The streams were conditioned by the 1st of June. Maintenance work was carried on the remainder of the year.

Stream-oiling operations were begun on April 22, when *Aedes vexans* were found in the stream and pool areas.

On June 13 catch-basin-oiling activities were begun when *Culex pipiens* were found breeding therein. At this time it was found necessary to begin oiling operations in the marsh areas, and recommendation was made to the sewer department that a boat be equipped for this purpose. The equipment consisted of a pump so arranged as to pump water and oil, the water acting as a mechanical conveyor.

The inspection of private properties was begun by inspectors of the health department about May 1. It was recommended that they report their findings to this office, in order that they might be referred to the proper control organization.

The inspection of Federal properties was begun about the 1st of May and biweekly inspections made throughout the remainder of the year.

The Bureau of Fisheries, the Office of Public Buildings and Public Parks, and the Public Health Service cooperated in transferring *Gambusia affinis* from the reservoir maintained in the beaver pond at the Zoological Park to various stream and pond areas within the District of Columbia and vicinity.

One of the chief functions of the office was the coordination of reports of breeding and presence of mosquitoes. The inspection system was so set apart from the control organizations that the routing of such information to the interested agencies was most important.

The sanitary engineer of the District of Columbia sewer department was supplied with estimates of the cost of mosquito-control measures, with details, for the fiscal year 1932.

Contact was had with the following-named public utilities by this office and tentative plans were made for inspections of their properties, such as manholes, conduit lines, sumps, and trolley tunnels:

- The Capital Traction Co.
- The Chesapeake & Potomac Telephone Co.
- The Chesapeake & Ohio Canal Co.
- District of Columbia water department.
- Postal Telegraph & Cable Co.
- Potomac Electric Power Co.
- Washington Gas Light Co.
- Washington Railway & Electric Co.
- Western Union Telegraph Co.

Frequent rains caused a flushing action in these places and made observations difficult and nonrepresentative, with consequent delay in the work.

The absence of data collected during previous years made comparisons of the prevalence of mosquitoes difficult. Only hearsay and individual opinions could be considered. These indicated that the

control measures employed were successful, with consequent diminution of mosquitoes. There were a few local problems which were not solved completely. Local breeding was the basis of complaint in the majority of cases. When local breeding was eliminated, the areas enjoyed freedom from mosquitoes.

MISCELLANEOUS

During the last month of the fiscal year several experiments were started, in cooperation with the Office of Field Investigations of Malaria, the District of Columbia sewer department, and the Office of Public Buildings and Public Parks, to determine more efficient and cheaper methods of control.

RURAL HEALTH WORK

Cooperative demonstration projects in rural sanitation were carried on during the fiscal year ended June 30, 1931, in 213 counties in 27 States, as follows:

State	Number of counties	State	Number of counties	State	Number of counties
Alabama.....	10	Louisiana.....	24	Oregon.....	4
Arizona.....	3	Massachusetts.....	1	South Carolina.....	13
Arkansas.....	24	Michigan.....	5	South Dakota.....	1
California.....	5	Mississippi.....	12	Texas.....	1
Florida.....	2	Missouri.....	10	Virginia.....	11
Georgia.....	4	Montana.....	4	Washington.....	2
Idaho.....	1	New Mexico.....	8	West Virginia.....	14
Iowa.....	4	North Carolina.....	4		
Kansas.....	9	Ohio.....	1	Total.....	213
Kentucky.....	32	Oklahoma.....	4		

The details of the work carried on in the 213 projects will be made the subject of a special report.

The appropriation for the rural sanitation work of the Public Health Service for the fiscal year 1931 was \$338,000. Against the amount appropriated was set up a budget saving of \$13,520. Thus \$324,480 was available for expenditure during the fiscal year 1931. Of this amount a total of \$285,816.45 was expended through specific allotments toward the support of 213 field projects and \$17,344.35 was used for special studies and administration.

According to data collected by the rural sanitation office from the State health departments the number of counties or equivalent divisions provided with local health service reaching all rural sections thereof and under the direction of whole-time county or district health officers was 558 at the beginning of the calendar year 1931. This represented a gain of 53 over the figure for the preceding year. When it is borne in mind, however, that there are 3,073 counties in the United States, it is obvious that only a relatively small part of the rural area of the country is as yet provided with reasonably adequate health service. The demonstration work being carried on by the Public Health Service in cooperation with the States and counties has played an important part in such development of county health service as has been brought about. It is believed that

continued cooperation on the part of the Federal Government in this activity is essential to the ultimate success of the program and that participation in the demonstration work on a larger scale by the Public Health Service is justifiable, to the end that the area of rural territory under adequate health service may be extended more rapidly.

On February 6, 1931, an appropriation of \$2,000,000 became available to the Public Health Service for cooperation with the States in the drought-stricken areas in studies of and demonstration work in rural sanitation. The appropriation is for use from the date of passage of the act until June 30, 1932. The provisions of the act are similar to those of the regular rural sanitation act, with the following exceptions:

1. The funds are limited to the drought-stricken areas.
2. It is not required that at least 50 per cent of the total cost of any cooperative project shall be defrayed from State and local sources.
3. The appropriation is also available for the purchase and distribution of medical supplies.
4. It is strictly an emergency appropriation to meet emergency conditions resulting from the unprecedented drought and terminates upon a specific date.
5. It is to be expended in accordance with regulations prescribed by the Public Health Service.
6. A report of the extent and circumstances of the several cooperative projects is to be made to Congress at the beginning of each regular session.

Telegraphic dispatches were immediately issued by the Surgeon General to all of the State health officers concerned, calling for a conference in Memphis on February 10, 1931, to consider plans for carrying out the provisions of the act. Twenty-two States were considered as being included in the drought-stricken areas, of which 20 were represented at the conference. The conference approved plans submitted by the Public Health Service for cooperation with State and local health authorities under the provisions of the act.

In addition the following resolutions were passed by the conference:

1. *Resolved*, That the public health officials of the States of the drought-stricken areas of the United States in assembly in the city of Memphis ask the Surgeon General of the Public Health Service, immediately upon his return to Washington, to confer with and urge the American Red Cross to continue to furnish necessary medicines, also surgical supplies, to the indigent sick in the areas as an emergency measure. It is the sense of the body that this great international relief organization, designated as an official agency by the Congress, has always met the actual needs everywhere and has never failed to afford the basic elements of disaster relief, whether cyclone, flood, fire, or famine. The first essentials are considered to be necessary food, medicines, and clothes for the needy. Nothing less can be expected of the American Red Cross by the American people.

2. That it is the sense of this body that the distribution of medical supplies referred to in the bill is construed as meaning biological supplies used in the prevention and control of disease as a public health measure.

The first cooperative budgets under this appropriation became effective March 1, 1931, and extended to June 30, 1931, at which time new

budgets were put in operation for the year July 1, 1931, to June 30, 1932.

The States in which cooperative projects were conducted for the period ending June 30, 1931, together with the number and character of projects in each State under approved budgets, are as follows:

RURAL HEALTH WORK

Cooperative demonstration projects in rural sanitation (drought-stricken area), fiscal year ended June 30, 1931

State	Number of counties	Health districts	Towns	Mobile units	Central Administration
Alabama.....	31				1
Arkansas.....	69			1	2
Georgia.....	3			3	2
Illinois.....				2	1
Indiana.....	6		1		
Kentucky.....	34				
Louisiana.....	20				2
Mississippi.....	15				2
Missouri.....		5			
Montana.....	4				1
Oklahoma.....	7				2
Pennsylvania.....				1	2
Tennessee.....	22	5 (37)		1	
Texas.....	5	16 (73)		1	2
Virginia.....	20	2 (27)		1	2
West Virginia.....	33	4 (38)			1
Total.....	269	132(175)	1	10	21

¹Counties in districts.

It was the opinion of the conference that the character and extent of future cooperative county health work, so far as the Federal Government is concerned, would be determined largely by the manner in which this appropriation was administered, the uses to which it was put, and the results accomplished. It is with satisfaction that this division is able to report that, without exception, every State which has requested cooperation under the provisions of this act has made an earnest and successful endeavor to comply with the principles which were adopted at the Memphis meeting, and in spirit and in practice to organize the work upon a rational, conservative basis, which may be relied upon to fulfill the hopes and ambitions of those concerned with the making and administration of the appropriation and to merit their confidence in future undertakings. The division has endeavored to serve the States promptly and effectively and to meet their needs as completely as possible under the limitations of the regulations which apply to all agencies of the Federal Government. In compliance with the terms of the appropriation act, a special report will be rendered to Congress at its next session.

COOPERATION WITH STATE AND MUNICIPAL BOARDS OF HEALTH IN THE PROVISION OF ADEQUATE RULES AND REGULATIONS FOR THE PREVENTION OF THE INTRODUCTION AND SPREAD OF CONTAGIOUS AND INFECTIOUS DISEASES

At the request of State and municipal health authorities, studies of the rules and regulations pertaining to the prevention of the spread of contagious and infectious diseases were conducted at the

following places: El Paso, Tex.; Knoxville, Tenn.; Colorado State Board of Health; and Oklahoma State Health Department.

A report on the study of the Oklahoma State Health Department was published during the year. It is expected that reports of the other studies will be published in the course of the next fiscal year.

SPECIAL WORK IN PUBLIC HEALTH ADMINISTRATION

During the first half of the fiscal year Surg. J. W. Mountin was on duty with the Tennessee State Department of Health completing certain studies on the organization and conduct of State and local public health work. These studies were designed to determine the public health needs of different areas and the effectiveness of various public health procedures and plans of organization. The successive steps in these studies were a study of public health needs, projection of programs, and appraisal of results. These studies in a great measure have assisted in formulating the present public health program in Tennessee, which for the most part is applicable in many sections of the United States. The findings of these studies, the methods evolved, and an evaluation of the results may be found in the following publications:

Policies and Practices of the Tennessee State Health Department. Published by the State Department of Health of Tennessee.

Manual for the Conduct of County Health Departments. Published by the State Department of Health, Tennessee.

Record Manual of the Tennessee State Health Department. Published by the State Department of Health, Tennessee.

Apportionment of Financial Aid for County Health Work. Public Health Reports, January 3, 1930; Reprint No. 1346.

The Training of County Health Officers. Public Health Reports, Oct. 3, 1930; Reprint No. 1416.

Review of Public Health Administration in Tennessee. (In manuscript.)

During the period of this assignment the officer acted as secretary of the public health section of the White House Conference on Child Health and Protection and as such was responsible for assembling a large part of the data and editing the report.

MISCELLANEOUS ACTIVITIES

In response to a request from the State health officer of Texas, assistance was given in the organization of a special malaria control demonstration project in the eastern section of the State. Asst. Surg. C. D. Head was detailed to assume charge of the work for the State health department during the organization period.

Assistance was given to the State Board of Health of South Carolina through the furnishing of biologies for use in preventing the spread of epidemic diseases.

Surg. C. V. Akin was detailed to South Carolina for the purpose of assisting the State health officer in studies and demonstrations in the control of pellagra.

CONFERENCE OF THE SURGEON GENERAL WITH THE STATE AND TERRITORIAL HEALTH OFFICERS

In accordance with the act of July 1, 1902, the Twenty-ninth Annual Conference of State and Territorial Health Officers with the Public Health Service was held April 27-30, 1931, in Washington,

D. C. Joint sessions were held with the Forty-sixth Annual Conference of State and Provincial Health Authorities of North America. Delegates from 34 States and the District of Columbia and Porto Rico, and visitors from the Provincial Health Department of Canada and the Pan American Sanitary Bureau were in attendance.

An interesting program was arranged and the following papers were presented and discussed:

1. Current national and international public health problems.
2. Essential considerations in connection with the rural health program.
3. A summary of investigational work on antifreeze mixtures.
4. The problem of postvaccination encephalitis with special reference to the United States.
5. Some recent observations on endemic typhus fever.
6. The epidemiology and clinical recognition of a disease of the Rocky Mountain spotted fever type in the eastern section of the United States.
7. The laboratory identification of a disease of the Rocky Mountain spotted fever type in the eastern section of the United States.
8. Expansion of the work of the Public Health Service upon Rocky Mountain spotted fever and other tick-borne diseases.
9. The present status of the morbidity reporting area.
10. Proposed method of reporting efficiency of State control over shellfish sanitation.
11. The coordination of the sanitary control of bottled mineral waters.
12. Child hygiene.
13. Our responsibility in the drought area under the new Federal appropriation.

DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION

In charge of Asst. Surg. Gen. F. A. CARMELIA

QUARANTINE TRANSACTIONS

During the fiscal year 1931 medical officers of the Public Health Service engaged in the administration of the United States quarantine laws inspected 22,504 vessels and 2,891,746 persons. Of these, 14,955 vessels, 773,743 passengers, and 1,039,524 members of crews were inspected at the continental maritime stations. At insular stations, 3,417 vessels, 161,037 passengers, and 235,537 members of crews were inspected. At foreign stations, 4,132 vessels, 365,194 passengers, and 316,711 members of crews destined for ports of the United States were inspected. There were 2,942 vessels fumigated or disinfected at continental stations, 540 at insular stations, and 590 at foreign stations. At the border quarantine stations there were 101,970 travelers inspected, exclusive of the local interurban traffic, numbering 10,304,042 who were under surveillance. In addition, 3,137 airplanes arrived at official airports of entry in the United States from foreign ports requiring quarantine inspection; a total of 21,028 persons carried on these planes were accorded medical examination prior to entry.

GENERAL PREVALENCE OF QUARANTINABLE DISEASES

Yellow fever.—Yellow fever continues to be reported from the Gold Coast and British Camaroons in Africa. One case was reported at Lagos, Nigeria, which was said to have been infected in a laboratory. Health conditions reported during the year regarding the possible presence of this disease near certain ports of South America on the Caribbean coast, particularly the western part, and on the east coast from the Amazon River to Rio de Janeiro, were such as to warrant the issuance of instructions to quarantine officers at stations located on the Gulf and Atlantic coasts south of the southern boundary of Maryland to be on the alert in making the quarantine inspection of vessels which have called at these ports, especially at the smaller ports along the east coast of South America. The port of Para (Belem), at the mouth of the Amazon River, particularly is regarded as infected, and scattered cases have been reported at various interior points more or less close to several of the seaports along the coast. It is understood that the Brazilian authorities are maintaining an effective antimosquito campaign in the principal seaports and that danger of maritime spread is decreased accordingly. Information has also been received from reliable unofficial sources indicating the occurrence of cases of suspected yellow fever in the interior of Colombia in the region of

Santa Marta and Barranquilla, but as yet these reports lack official confirmation.

Cholera.—As in previous years, cholera has been confined principally to the continent of Asia. However, at the beginning of the fiscal year this disease was present in epidemic form in several of the islands in the Visayas. There was also a minor epidemic in the city of Manila, some 50 cases occurring there. Interisland quarantine was put into effect against several ports, effective at various times during the year for Manila, Cebu, Iloilo, the Province of Iloilo, the Province of Capiz, the island of Bohol, and the island of Samar. This epidemic, however, can not be attributed to any recent importation, as past history shows that cholera recurs in epidemic form in these islands every four or five years and may be considered as endemic there. The number of cases and deaths from this disease was small as compared with the number during outbreaks which occurred during the latter part of the last century and the early part of the present century.

Plague.—Plague was reported from nearly all parts of the world during the year 1930, although the number of cases in British India, which is the principal world focus of plague, was smaller than the number reported in 1929. There were a few cases of plague reported in Europe. One case occurred in Paris on July 15, 1930, and 13 cases at Marseilles among dock workers and contacts from August to November, 1930; 14 cases and 10 deaths were reported in Russia and 2 cases in Greece. In countries adjoining Europe, Egypt heads the list with 966 cases, with 182 deaths.

Plague, by reason of its wide geographical distribution and the means of its spread, remains one of the major pandemic diseases, which requires the constant vigilance of health authorities in all countries. No cases of this disease, however, occurred on board vessels arriving at United States quarantine stations during the year.

Smallpox.—Smallpox is perhaps the most widespread of the quarantinable diseases. During the fiscal year cases of smallpox were reported from nearly all the countries of the world. The prevalence of this disease has been increasing in parts of the United States for several years; it is, however, very mild in type, with but few deaths when compared with the large number of cases.

Typhus fever.—Typhus fever was reported during the fiscal year from many ports which have commerce with the United States. It is endemic in Mexico and in many eastern European countries. This disease occurred in epidemic form in Poland, Rumania, Lithuania, Morocco, Egypt, Turkey, Algeria, Bulgaria, and Greece, and appeared to a limited extent in Yugoslavia, Portugal, Irish Free State, Spain, Scotland, and Austria. A mild epidemic occurred during January and February, 1931, in Czechoslovakia, with a total of 104 cases and 5 deaths.

CHANGES IN QUARANTINE PROCEDURE

AN ACT EXTENDING QUARANTINE-INSPECTION SERVICE

The Congress of the United States toward the close of the seventy-first session passed legislation, which was approved by the President on March 3, 1931, to enable quarantine-inspection service to be pro-

vided after the hour of sunset in those United States ports of entry in which the need therefor exists. Up to the present the performance of quarantine inspection has been confined to daylight hours, between sunrise and sunset, at all ports, with the exception of vessels arriving in distress and requiring immediate emergency passage through quarantine.

This new legislation provides that the Secretary of the Treasury shall establish by regulation, following a determination of the commercial needs of the port for such services, definite hours for the performance of quarantine inspection at each quarantine station during the 24 hours each day or any fraction thereof. In those ports in which an extension of the present sunrise-to-sunset hours for the performance of quarantine inspection seems desirable, the port authorities and/or shipping interests in such ports may make an application for extended quarantine service to the Secretary of the Treasury, setting forth definitely the period for which it is desired that quarantine services be made available during each 24 hours and supported by data showing the commercial necessity therefor. The Secretary of the Treasury, upon receipt of such application, gives the matter consideration and prescribes the hours during which quarantine services may be performed in such ports. Applications for such extended quarantine services for the ports of New York, Boston, Philadelphia, San Pedro, and New Orleans are now pending.

However, the quarantine inspection of vessels arriving from ports infected with quarantinable disease will be restricted to hours of daylight in all ports, and vessels which are not equipped with adequate artificial lighting facilities to permit of proper quarantine inspection during hours of darkness also will be inspected only during hours of daylight. Any vessel arriving during hours of darkness may anchor in the quarantine anchorage and may elect to undergo quarantine inspection the following morning.

This legislation also modifies the charges made for quarantine services rendered at the port of New York (which heretofore have been higher) to conform with the charges made at other United States ports.

Another purpose of the act is to correct a discrimination that heretofore obtained under existing laws respecting officers and employees engaged in the navigation and care of the quarantine vessels operated by the Public Health Service in the various maritime ports of entry. Heretofore personnel of the Public Health Service employed in the care and navigation of some 70 vessels of the Public Health Service were the only persons so engaged on American vessels, either privately owned or Government owned, who were not entitled to free medical care and hospital treatment in case of sickness or injury; the employees of other Government vessels and of the American merchant marine were already beneficiaries of the Public Health Service. This feature of the bill now permits the Public Health Service to take care of its own seamen on a basis of equality with the care it is required to furnish seamen employed on other Government vessels or on the American merchant marine.

In addition, the act provides that officers and employees of the Public Health Service assigned to quarantine duty at any of the national quarantine stations or at infected foreign ports, and who

are necessarily exposed from time to time to direct infection with quarantinable diseases and other infectious and contagious diseases and to injury in the course of their performance of duty incident to exposure to dangerous gases used in fumigation and disinfection procedures and to boarding vessels in rough weather, who become sick or injured in line of duty shall be furnished medical care, hospital treatment, and similar benefits as beneficiaries of the Public Health Service.

Following is the text of the act:

[PUBLIC—No. 796—71ST CONGRESS]

(S. 5743)

An Act To authorize twenty-four-hour quarantine inspection service in certain ports of the United States, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the act entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service," approved February 15, 1893, as amended, is further amended by adding at the end thereof the following new sections:

"SEC. 13. The original bills of health required to be obtained in duplicate in foreign ports under the provisions of section 2 of this act shall be presented to the collector of customs in accordance with the provisions of section 5 of this act, and the duplicate copies of such bills of health shall be presented to the quarantine officer at the time quarantine inspection is performed by him.

"SEC. 14. The Secretary of the Treasury shall establish by regulation the hours during which quarantine service shall be performed at each quarantine station, and, upon application by any interested party, may establish quarantine inspection during the twenty-four hours of the day, or any fraction thereof, at such quarantine stations as, in his judgment, require such extended service; but the Secretary may restrict the performance of quarantine inspection to hours of daylight for such arriving vessels as can not, in his opinion, be satisfactorily inspected during hours of darkness. Nothing herein contained, however, shall be construed to require a vessel upon arriving at the quarantine anchorage to undergo quarantine inspection during the hours of darkness, unless the quarantine officer at such quarantine station shall deem an immediate inspection necessary to protect the public health; nor shall any provision of this act be construed to require uniformity in the regulations governing the hours during which quarantine inspection may be obtained at the various ports of the United States.

"SEC. 15. The certificate of health required by section 5 of this act shall upon the arrival of any vessel from foreign ports at the anchorage or place established for quarantine inspection purposes in any port of the United States, be procurable at any time within which quarantine services are performed at such station from the quarantine health officer, following satisfactory inspection.

"SEC. 16. The Secretary of the Treasury is authorized and directed to prescribe a schedule of charges for quarantine services rendered to vessels at each of the national quarantine stations, which charges shall be reasonable and uniform for all ports, including the port of New York. The quarantine officer in each port of entry shall promptly forward to the collector of customs at such port an itemized statement of the quarantine services rendered to each vessel at the prescribed charges, which charges shall be paid to the collector of customs by said vessel prior to clearance or departure from such port. All such collections shall be accounted for by the collector of customs and shall be covered into the Treasury as miscellaneous receipts.

"The provisions of the act of June 5, 1920 (41 Stat. 875), relating to the schedule of fees and rates of charges to be adopted and promulgated by the Secretary of the Treasury at the New York quarantine station, are hereby repealed.

"Sec. 17. Any officer or employee of the Public Health Service on duty at any national quarantine station or on a national quarantine vessel, or detailed for duty in foreign ports, under the provisions of sections 2 and 5 of this act, who is suffering from sickness or injury incurred in line of duty, shall be a beneficiary of the Public Health Service and shall be entitled to receive all necessary medical treatment and other benefits authorized to be furnished to beneficiaries."

Sec. 2. There is hereby authorized to be appropriated the sum of \$100,000, or so much thereof as may be necessary, to carry out the provisions of this amendatory act.

Sec. 3. Whenever steamship companies desiring the benefits of such extended quarantine service at any port shall offer to advance funds in order to permit the immediate institution of such service at such port, the Secretary of the Treasury may, in his discretion, receive such funds and expend the same for such purpose; and the moneys so contributed shall be repaid by the Secretary, without interest, from any funds appropriated under authority of section 2 of this act.

Approved March 3, 1931.

MENINGOCOCCUS (CEREBROSPINAL) MENINGITIS

But few cases of meningitis on vessels arrived at Pacific coast ports of the United States during the past fiscal year, reflecting the effectiveness of the regulations governing the importation of passengers and crews at ports in China and the Philippine Islands and their transportation to the United States. While Executive Order No. 5143, approved June 21, 1929, restricting for the time being the transportation of passengers from certain ports in the Orient, remained in force during the year, the regulations prescribed in accordance with the provisions of this Executive order have been modified from time to time as conditions warranted until, on November 7, 1930, first-class passengers were exempted from the application of the special meningitis regulations and steerage passengers were permitted shore liberty in ports of call, provided epidemic cerebrospinal meningitis was not prevalent in such ports.

In connection with the occurrence of cases of cerebrospinal meningitis among steerage passengers on vessels arriving from oriental ports, the Public Health Service is now conducting a study of ventilation and berthing facilities on vessels of a steamship line engaged in the carriage of oriental steerage to United States ports. These studies are being conducted jointly by representatives of the Public Health Service, the steamship line medical service, and the University of California.

PSITTACOSIS

Executive Order No. 5264, issued by the President on January 24, 1930, restricting for the time being the introduction of parrots into the United States, remains in effect. The regulations promulgated by the Secretary of the Treasury under date of February 3, 1930, under the provisions of this Executive order, governing the importation of parrots into ports of the United States, were modified on October 21, 1931, after a conference with the Pet Dealers Association of America and members of the Biological Survey of the United States Department of Agriculture, to permit the importation of commercial shipments of these birds under approved sanitary restrictions relating to crates, air space, etc. It is believed that these regulations represent the minimum conditions under

which a reasonable protection from such a danger may be had short of the more drastic prohibition of all importation, as authorized by the Executive order. These regulations have been successful in preventing the spread of this disease through the commercial importation of infected birds, and the past year has shown a decided decrease in the number of cases of this disease in the United States as compared with the preceding year.

The problem of the satisfactory control of psittacosis has become of international interest in the past year, and this subject will form one of the major topics for discussion at the next meeting of the permanent committee of the Office International d'Hygiene Publique in Paris in October, 1931.

SANITARY CONTROL OF AERIAL NAVIGATION

One of the major problems to-day confronting not only this country but the countries of Latin America, Europe, Asia, and Africa, is the sanitary control of aerial navigation. Regular lines of aircraft have been established, providing direct and rapid communication between areas in Africa, Asia, and South America, which have long been endemic centers of various pestilential diseases, such as cholera, plague, and yellow fever, and noninfected but infectible territory in Europe, North America, and, in fact, almost all the rest of the entire world. The journey by airplane from most of the endemic centers of these various pestilential diseases is usually less than the incubation period of these diseases, excepting journeys from endemic centers of cholera.

The problem of the sanitary control of aerial navigation has been receiving international attention by leading sanitarians for several years, finally culminating in a proposed convention for the sanitary control of aerial navigation, which was drafted by the permanent committee of the Office International d'Hygiene Publique in Paris at the May, 1930, meeting. This item also formed one of the major topics for discussion at the October meeting of the permanent committee the same year, and, likewise, consideration of the proposed convention formed one of the principal topics for discussion at the meeting in April of the Second Pan American Conference of Directors of Health held in Washington, D. C., under the auspices of the Pan American Sanitary Bureau. At the May, 1931, meeting of the permanent committee of the Office International d'Hygiene Publique a final draft of this convention for the sanitary control of aerial navigation was drawn up and adopted.

During the past fiscal year there was inaugurated a plan of keeping open for 24 hours daily the principal ports along the United States-Mexican border. This step was taken largely as a matter of the promotion of international comity, and the plan went into effect February 1, 1931. Because of the lack of funds and the consequent inability of the Public Health service to provide additional personnel to take care of the added duties incident to 24-hour service, a rather heavy burden has been placed upon the quarantine officers on duty at these ports. To cope with this situation the Public Health Service authorized border quarantine officers, at their discretion, to issue local quarantine passes to returning local travelers and such

other persons with respect to whom they are able to satisfy themselves that the habits, whereabouts, duration of visit, etc., of such persons while in Mexico would not make them likely to become infected with any one of the quarantinable diseases. Persons holding such passes may be permitted entry by border guards during such hours as the port may be open for entry and during which quarantine inspections, etc., are not available. This plan of affording 24-hour service along the border is in the nature of an experiment, and the practice described appears to be working out temporarily until sufficient additional funds are available for the employment of additional personnel to take care of this additional work.

During the past year a change has been made in the measures designed to prevent the introduction of typhus fever from ports of embarkation in Europe. This step was taken in view of the better organization of sanitary services and improvement in sanitary conditions now obtaining in Europe. Where formerly the application of the measures designed to prevent the spread of typhus fever was based upon broad geographic areas, now their application is contingent upon the actual endemic or epidemic prevalence of typhus fever in such ports, places, or localities from which persons destined for the United States have originated or embarked.

The special commission appointed by the health section of the League of Nations in 1927 to make a detailed study of the fumigation of vessels for the destruction of rats, with particular reference to the fumigation with hydrocyanic acid of vessels while laden with cargo, has made plans to visit the New York quarantine station in September, 1931, to make some practical studies in connection with this work. This commission first met at Paris on May 14, 1928, for a preliminary discussion of the lines the study should follow, and the Surgeon General of the Public Health Service was appointed chairman. A preliminary report of the investigations carried on in conformity with these recommendations was submitted by the chairman to the commission at a meeting held in Paris on May 15, 1929, for which the commission expressed its appreciation, and it was at this meeting that the commission recommended that certain of its members and experts visit the United States to study the execution of the program of the special investigations and researches approved by the commission. In the meantime the New York quarantine station has been carrying out work along these lines, and in anticipation of the proposed visit of these experts a résumé report of these investigations has been prepared as a guide for the commission.

RAT PROOFING OF VESSELS

Continued interest is being manifested in the rat proofing of ships, not only in this country but abroad. During the year the principles of rat proofing were demonstrated to nine representatives of foreign countries, and it is now almost a universal practice to include rat proofing as a standard requirement for all contracts for the construction of new ships.

The following statistics disclose some interesting facts regarding the extent of rat proofing of ships in the United States and its adoption by other countries: Rat proofing of ships has steadily increased,

until at the present time more than 75 per cent of the better-class passenger ships regularly entering the port of New York and many cargo vessels have been or are in process of being rat proofed in accordance with the methods developed by the Public Health Service, as follows:

Number of vessels completed or being rat proofed.....	288
Number of owning or operating companies.....	47
Number of nations to which these ships belong.....	14
Nationality :	Number vessels rat proofed
American	111
British	77
German	18
Swedish	11
Norwegian	28
Italian	8
Spanish	8
Dutch	8
French	4
Chilean	3
Danish	3
Republic of Panama	1
Japanese	7
Mexican	1

FLOATING EQUIPMENT

Continuing the policy of reclaiming and reconditioning the older quarantine vessels whose physical condition warrants the expenditure of funds for major repairs, several vessels were reconditioned during the year. In addition, new construction is under way and several new vessels have recently been placed in service. So many vessels have been condemned as unfit for further service and unworthy of the necessary major repairs that a considerable amount of new construction is required to replace these vessels. During the year several stations were without adequate floating equipment, and it was found necessary as a temporary expedient to hire launches at these stations with which to carry on routine work until such time as new vessels could be supplied.

The most important work undertaken in the way of reconstruction of old vessels was the complete rebuilding of the tug *W. C. W. Glazier* (formerly the *Elk*). This vessel was practically worthless except for the hull; it was, accordingly, completely dismantled and converted to Diesel power. New decks, superstructure, and arrangements were worked out, so that this vessel is now completely modernized in all respects and is one of the fastest and trimmest vessels of this service. It is attached to the Savannah (Ga.) quarantine station. The launch *Q-10*, which is stationed at the Fort Monroe (Va.) quarantine station, became useless, due to a worn-out gasoline engine which could not be placed in operating condition without considerable expenditure of funds. This machinery was removed and a new Diesel engine installed, which, in conjunction with minor structural alterations, has made a very handy station boat for use between Craney Island and the mainland. The launch *Q-9* at Savannah, Ga., was recently converted from gasoline power to Diesel. Arrangements were made both in this launch and the *Q-10* for 1-man control

from the steering position, so that in emergency these vessels can be handled by one competent employee.

Two 41-foot launches, the *Q-13* and the *Q-14*, were constructed new during the year. These vessels were especially designed for semitropical service, to be used as a means of transporting freight and passengers between the mainland and the quarantine station.

The *Q-14* is now stationed at the Fort Monroe (Va.) quarantine station, and the *Q-13* is stationed at the Cape Fear quarantine station, Southport N. C. These vessels, although comparatively small, during the trip from the builder's yard at New York down the coast to their destination proved to be unusually able sea boats and very easily handled under all conditions. Both vessels have Diesel power and are arranged for 1-man control from the pilot house.

A new 60-foot all-steel Diesel tug, the *W. M. Wightman*, was built at San Francisco and delivered for service at the San Diego quarantine station. This vessel, in addition to the usual pilot house and engine room, has accommodations for medical officers, as well as a compartment for the transportation of freight. It also had a long delivery trip from San Francisco down the Pacific coast to San Diego and proved to be one of the most seaworthy vessels of her size.

VIOLATIONS OF QUARANTINE LAWS

During the fiscal year it was necessary for the department to assess fines aggregating only \$410 for violation of the act of February 15, 1893, due to the failure of masters of vessels to present American consular bills of health, and for other violations of the quarantine laws administered by the Public Health Service.

QUARANTINE TRANSACTIONS AT CONTINENTAL AND INSULAR QUARANTINE STATIONS

TABLE 1.—Summary of quarantine transactions at continental and insular stations for the fiscal year ended June 30, 1931

(1) INSPECTIONS

	Total number	Passed free pratique	Passed provisional pratique	Detained	Remarks
Vessels.....	18,372	12,998	5,374	100	Includes workaways. Includes stowaways.
Seamen.....	1,275,061				
Passengers.....	934,780				

(2) DETENTIONS

	Yellow fever		Cholera		Smallpox	
	Number	Days	Number	Days	Number	Days
Vessels.....	1	3	4	23	8	20½
Seamen.....	33	99	175	1,041	229	491
Passengers.....			57	342	3	6
Sick.....			12		4	31

¹ On board interisland vessel at Manila.

TABLE 1.—Summary of quarantine transactions at continental and insular stations for the fiscal year ended June 30, 1931—Continued

(3) LABORATORY

Number of rats examined.....	6,073
Number of fleas classified.....	3,345
Number persons vaccinated (for smallpox).....	18,371
Number persons vaccinated (for cholera).....	38,487
Other examinations:	
Stools examined for cholera.....	9,737
Nasal swabs examined for meningococcus.....	9,885
Spinal fluid examination for meningococcus.....	5

(4) TREATMENT OF VESSELS (FUMIGATING, TRAPPING, REMANDING)

(A) FUMIGATION

	Cyanide	Sulphur	Total
Vessels.....	2,861	621	3,482
Cubic feet fumigated.....	1,227,940,936	88,339,159	1,316,280,095
Net tonnage.....	8,679,911	706,299	9,386,210
Rats recovered.....	9,293	2,097	11,390

(B) TRAPPING

Number of vessels.....	17
Net tonnage.....	79,017
Number of traps.....	2,584
Number of rats.....	53

(C) REMANDS FOR FUMIGATION

	Mandatory vessels	Periodical vessels	For other purposes
From other ports.....	1,209	233	163 requests.
To other ports.....	1,191	221	

(5) RESEARCH

The following research work was done at the New York quarantine station:

1. Rat infestation survey as fumigation control.
2. Study of fumigation methods and effectiveness.
3. Study of fumigation as applied to loaded ships.
4. Study of fumigation of cockroaches.
5. Study of ratproofing on ships.

(6) FINANCIAL REPORT

Total amount of bills rendered for quarantine services..... \$439,796.35

(7) PORT SANITARY STATEMENTS AND BILLS OF HEALTH ISSUED

Number issued..... 48,989

(8) MEDICAL EXAMINATIONS OF ALIENS AT QUARANTINE STATIONS

	Number examined	Intensive	Class certified				Total certified
			A-1	A-11	B	C	
Passengers.....	88,534	4,667	2	68	179	24	273
Alien seamen.....	355,520	157,255	79	599	86	130	894

TRANSACTIONS AT CONTINENTAL MARITIME STATIONS

TABLE 2.—Summary of transactions at continental maritime stations for the fiscal year ended June 30, 1931

Stations	Vessels in- spected	Vessels fumigated		Passen- gers in- spected	Crew in- spected
		Cyanide	Sulphur		
Aberdeen, Wash.....	13	0	7	0	512
Angel Island, Calif. (San Francisco).....	557	466	0	33,468	31,055
Astoria, Ore.....	47	18	2	2	2,703
Baltimore, Md.....	731	256	0	293	24,777
Beaufort, S. C.....	0	0	0	0	0
Boca Grande, Fla.....	12	0	0	306	8
Boston, Mass.....	884	182	0	33,934	60,752
Brunswick, Ga.....	12	0	0	0	275
Carrabelle, Fla.....	0	0	0	0	0
Cedar Keys, Fla.....	0	0	0	0	0
Charleston, S. C.....	139	2	14	254	4,813
Corpus Christi, Tex.....	45	0	5	30	1,554
Eastport, Me.....	1	0	0	0	38
Eureka, Calif.....	0	0	0	0	0
Fall River, Mass.....	62	0	0	5	2,205
Fernandina, Fla. (Cumberland Sound).....	4	0	1	0	150
Fort Bragg, Calif.....	0	0	0	0	0
Fort Everglades, Fla.....	0	0	0	0	0
Fort Pierce, Fla.....	0	0	0	0	0
Fort Monroe, Va.....	369	3	73	237	13,728
Freeport, Tex.....	16	0	0	3	575
Galveston, Tex.....	711	103	0	1,406	26,282
Georgetown, S. C.....	10	0	0	0	148
Gloucester, Mass.....	0	0	0	0	0
Gulfport, Miss.....	31	0	6	3	1,066
Jacksonville, Fla. (St. Johns River).....	146	19	0	263	4,493
Key West, Fla.....	205	0	12	16,736	13,709
Lewes, Del. (Delaware Breakwater).....	2	0	0	0	18
Marcus Hook, Pa.....	887	289	6	2,182	33,048
Marshfield, Ore. (Coos Bay).....	11	0	3	0	385
Miami, Fla.....	793	25	0	24,168	25,355
Mobile, Ala.....	242	40	12	191	6,959
Monterey, Calif.....	0	0	0	0	0
Morgan City, La. (Atchafalaya).....	0	0	0	0	0
New Bedford, Mass.....	8	0	4	62	117
New London, Conn.....	26	0	0	25	893
New Orleans, La.....	1,492	318	0	12,752	59,710
Newport, Ore.....	0	0	0	0	0
Newport, R. I.....	9	0	0	25	226
New York, N. Y. ¹	4,258	566	0	512,388	609,839
Ogdensburg, N. Y.....	0	0	0	0	0
Panama City, Fla.....	7	2	0	0	183
Pascagoula, Miss.....	0	0	0	0	0
Pensacola, Fla.....	60	11	0	2	2,112
Plymouth, Mass.....	0	0	0	0	0
Port Aransas, Tex.....	0	0	0	0	0
Portland, Me.....	111	0	11	91	3,684
Portland, Ore.....	17	12	0	0	669
Port St. Joe, Fla.....	0	0	0	0	0
Port Townsend, Wash. ²	210	159	7	93	3,507
Providence, R. I.....	96	0	1	5,577	6,466
Sabine, Tex.....	201	17	0	54	6,847
San Diego, Calif. (Point Loma).....	607	0	15	15,471	18,278
San Luis Obispo, Calif. (Port San Luis).....	12	0	0	0	483
San Pedro, Calif.....	1,428	178	0	11,031	59,593
Santa Barbara, Calif.....	0	0	0	0	0
Savannah, Ga.....	103	20	0	228	3,679
Searsport, Me.....	20	0	0	8	516
Southbend, Wash.....	6	0	2	0	236
Southport, N. C. (Cape Fear).....	51	0	10	136	1,901
Tampa, Fla.....	228	65	0	183	5,620
Vineyard Haven, Mass.....	0	0	0	0	0
Washington, N. C.....	0	0	0	0	0
West Palm Beach, Fla.....	75	0	0	166	357
Total.....	14,955	2,751	191	671,773	1,039,524

¹ Includes Perth Amboy, N. J.² Includes all ports on the Puget Sound.

TRANSACTIONS AT UNITED STATES AIR PORTS OF ENTRY FOR AIRPLANES FROM FOREIGN PORTS

TABLE 3.—Summary of transactions at continental and insular stations for the fiscal year ended June 30, 1931

Location	Name of airport (officially designated)	Distance in miles to nearest Public Health Service station	Date designated	Number of airplanes arriving from foreign ports	Number of airplanes inspected by Public Health Service	Number of persons arriving from foreign ports or places	Number of persons inspected by Public Health Service	Number of aliens inspected by Public Health Service	Number of aliens certified for disease
Akron, Ohio	Municipal Airport ¹		Apr. 8, 1929	(?)					
Albany, N. Y.	do.		Sept. 28, 1928						
Ajo, Ariz.	do.	6	Nov. 15, 1929	8	0	22	1	1	0
Bellingham, Wash.	Graham Airport ¹		Apr. 18, 1930	5	0	11	0	0	0
Boston, Mass.	Boston Airport ¹			1	0	2	0	0	0
Brownsville, Tex.	Municipal Airport		Jan. 8, 1930	807	492	3,475	2,838	1,161	10
Buffalo, N. Y.	do.	5	June 10, 1929	0	0	0	0	0	0
Detroit, Mich.	Ford Airport ¹		Aug. 1, 1929						
	Wayne County Airport		Feb. 10, 1931	0	0	0	0	0	0
	Municipal Airport ¹		June 10, 1929						
Douglas, Ariz.	Municipal Air Field ¹		Jan. 8, 1930	0	0	0	0	0	0
Eagle Pass, Tex.	Municipal Air Field ¹	1½	Mar. 5, 1930	3	3	10	0	0	0
El Paso, Tex.	El Paso Municipal Airport ¹	9	Aug. 15, 1929	315	315	979	979	143	2
Great Falls, Mont.	Vance Airport ¹		June 2, 1930	(?)					
Havre, Mont.	Municipal Airport ¹		do.	0	0	0	0	0	0
Juneau, Alaska	Juneau Airport ¹		June 18, 1930	0	0	0	0	0	0
Ketchikan, Alaska	Ketchikan Airport ¹		do.	0	0	0	0	0	0
Key West, Fla.	Meacham Field	5	Dec. 20, 1929	2	2	5	0	0	0
Laredo, Tex.	Laredo Airdrome ¹	3½	Jan. 24, 1930	24	24	71	71	12	0
Malone, N. Y.	Port of Malone ¹		Apr. 18, 1930	6	0	12	0	0	0
Miami, Fla.	Pan American Field	8½	Oct. 16, 1928						
	Dinner Key ¹	6	Mar. 7, 1930	1,480	1,480	12,391	12,391	992	7
	Curtiss-Wright Field ¹	½	Apr. 22, 1930						
	Canadian Gateway ¹ (at Derby Field)		Aug. 1, 1929	0	0	0	0	0	0
Newport, Vt.	International Airport ¹		June 27, 1929	15	14	42	39	2	0
Nogales, Ariz.	Municipal Airport ¹	9	Feb. 2, 1930	(?)					
Pembina, N. Dak.	Municipal Airport ¹		June 2, 1930	(?)					
Plattsburg, N. Y.	Mobodo Airport ¹		Jan. 8, 1930	0	0	0	0	0	0
Portal, N. Dak.	Portal Airport ¹		do.	0	0	0	0	0	0
Port Angeles, Wash.	Port Angeles Airport ⁴	52	June 18, 1930	0	0	0	0	0	0
Port Townsend, Wash.	Port Townsend Airport ¹		June 4, 1928	(?)	0	0	0	0	0
St. Paul, Minn.	Municipal Air Field		Dec. 27, 1928						
San Diego, Calif.	Ryans Field ¹		Jan. 24, 1930	535	339	2,402	1,582	19	
	Lindbergh Field								

¹ Temporary permission

² No medical officer of Public Health Service.

³ Authorized for use but not officially designated.

⁴ Closed June 30, 1931.

TABLE 3.—Summary of transactions at continental and insular stations for the fiscal year ended June 30, 1931—Continued

Location	Name of airport (officially designated)	Distance in miles to nearest Public Health Service station	Date designated	Number of airplanes arriving from foreign ports	Number of airplanes inspected by Public Health Service	Number of persons arriving from foreign ports or places	Number of persons inspected by Public Health Service	Number of aliens inspected by Public Health Service	Number of aliens certified for disease
St. Thomas, Virgin Islands	St. Thomas Airport ¹			63	63	452	452	0	0
San Juan, P. R.	Escambron Field ¹		Aug. 8, 1928	254	189	2,124	1,667	318	1
	Isle Grande		Jan. 19, 1929						
San Pedro, Calif.	Alhambra-Western Airport Express Field	12	Jan. 11, 1930	154	0	939	0	0	0
	Allen Field	10	Jan. 8, 1930						
Sasabe, Ariz.	Glendale-Grand Central Air Terminal	30	Nov. 20, 1929	0	0	0	0	0	0
Scobey, Mont.	Customs Station		Apr. 22, 1931						
Seattle, Wash.	Scobey Airport ¹		June 2, 1930	4	4	11	11	0	0
	Boeing Field		Sept. 11, 1928	590	0	1,766	0	0	0
	Lake Union		Dec. 27, 1928						
Spokane, Wash.	Felts Field ¹		June 2, 1930	(?)					
Swanton, Vt.	Missisquoi Airport ¹		July 18, 1930	(?)					
Watertown, N. Y.	Western Municipal Airport ¹		June 2, 1930	(?)					
West Palm Beach, Fla.	Palm Beach ¹		Dec. 2, 1929	213	213	997	997	24	0
Total				4,479	3,137	25,351	21,028	2,672	20

¹ Temporary permission.² No medical officer of Public Health Service.³ Authorized for use but not officially designated.

REPORTS FROM CONTINENTAL QUARANTINE STATIONS

Aberdeen, Wash.—Acting Asst. Surg. J. B. Kinne in charge. Post-office and telegraphic address, Aberdeen, Wash.

This quarantine station serves the three cities of Hoquiam, Aberdeen, and Cosmopolis, with Aberdeen in the center. The majority of vessels entering these ports are in the oriental lumber trade, practically all loading lumber for Japan. Being lumber-carrying ships, they did not, as a rule, harbor many rats.

During the fiscal year 13 foreign ships were inspected at this station, of which number 7 were Japanese, 2 Norwegian, 2 British, 1 Italian, and 1 Belgian. No quarantinable or infectious disease was found among the crew of any of these vessels.

Baltimore, Md.—Surg. H. F. White in charge. Post-office and telegraphic address, Curtis Bay, Baltimore, Md.

Shipping entering the port of Baltimore during the past year was slightly below normal. Vessels brought cargoes from many countries and consisted chiefly of ferromanganese from England; iron ore from Cuba, Chile, Europe, and Australia; magnesite from Italy; pyrites from Spain; crude oil from Mexico, Colombia, and Venezuela; fruit from Cuba, Jamaica, Guatemala, and Honduras; lumber from British Columbia, the Philippines, and South America; and general cargoes from many parts of the world.

There were inspected, fumigated, or otherwise treated during the year, 1,036 vessels, of which number 256 were fumigated with hydrocyanic-acid gas and 99 were inspected and given deratization exemption certificates.

The general sanitary condition of the ships entering this port was good and no quarantinable diseases were discovered. Passenger traffic through this port has been incidental to cargo vessels having limited accommodations; however, the Baltimore Mail Steamship Co. inaugurated a passenger line operating from Baltimore to Havre and Hamburg, and it is anticipated that there will be an increase in such traffic in the future.

Boca Grande, Fla.—Acting Asst. Surg. H. P. Bevis in charge. Post-office and telegraphic address, Boca Grande, Fla.

During the year 12 vessels arrived at this port from foreign ports and were inspected. These vessels were practically all new modern ships of the latest approved construction without rat harborage. No quarantinable diseases were encountered.

Boston, Mass.—Surg. A. R. Sweeney in charge. Post-office and telegraphic address, Gallops Island, Boston, Mass.

This station is located approximately 1 mile from the mainland and 5 miles from the Army base, Boston, where a delivery office is maintained for the reception and storage of station supplies and as a waiting room for station personnel; also dock space is here available for the station boats when not in use at the quarantine station. Limited supervision is exercised over the quarantine activities at the subports of Lynn, Salem, and Beverly.

Beginning September 2, 1930, the station inaugurated the plan of quartering the boat personnel and one junior medical officer on the station, and tying up the boarding boat at the station instead of at the Army base in Boston, as formerly. As a consequence, early morning boarding is accomplished more promptly and the change is much more satisfactory to the shipping interests.

Despite the general decline in commerce as a consequence of the world-wide depression, the number of vessels arriving at this port decreased but 11 per cent during the past fiscal year. The general character of commerce, notably passenger traffic and importation of raw and manufactured materials and exports, mainly of manufactured products, was maintained. Besides many foreign vessels making the port of Boston the regular port of discharge for all cargo, many steamship lines make this the original port of entry from all parts of the world, handling a great variety of raw and manufactured goods. These vessels discharge part of their cargo at this port and thence proceed to contiguous Atlantic ports for final discharge. Some of the main items of imports are fruit from the West Indies and Central American ports; oil from Mexico and South America; coal from Russian ports on the Black Sea and ports in the United Kingdom; mahogany, palm oil, cocoa beans, ivory, etc., from Africa; rubber, coffee, jute, and manufactured goods from the Far and Near East; coffee, hides, casein, etc., from South American ports; iron ore from African and Newfoundland ports; and miscellaneous cargoes of raw

and manufactured goods from the continental European ports on the Mediterranean, Baltic, and Black Seas, Atlantic ports, and ports of the United Kingdom.

There was a reduction in the number of passengers passing through this port during the year. This reduction is largely accounted for in the decline in immigration. Cabin and tourist passenger traffic apparently suffered little decline. The several large passenger lines operating from German, United Kingdom, and Irish ports maintained their regular sailings. A Canadian steamship company inaugurated regular sailings during the year, handling tourists between Halifax, Boston, and West Indian ports. The passengers handled by this agency has helped to maintain the number of cabin and tourist passengers handled through this port.

During the year 884 vessels were inspected, on which were examined 60,752 seamen and 33,934 passengers. There were 182 vessels fumigated, with a total capacity of more than 78,000,000 cubic feet and more than 521,000 net tonnage. The rats recovered after fumigation were all autopsied and examined for plague, and inoculations of guinea pigs were made of suspected rodents. No plague-infected rats were found. Zyklon-B is exclusively used as a fumigant. Fifty-six vessels were issued deratization exemption certificates after thorough inspection.

Continued improvement is noted in the sanitary condition of vessels entering this port. Fewer rats are obtained after fumigation, which is no doubt accounted for by the improved character of construction of new vessels and the elimination of rat harborages on older vessels, as well as to the greater precautions taken to prevent the ingress of rats. These facts are evidenced by the acceptance of 145 foreign deratization certificates and 76 foreign deratization exemption certificates after inspection showed no evidence of rat infestation.

During the year no vessel was required to be detained on account of quarantinable disease. Special precautions, however, were taken for the prevention of the importation of smallpox from Central America and certain Far East ports, and the medical officers were on the alert also for the detection of any cases of plague from certain South American, West African, and far eastern ports.

A new Diesel tug, the *George B. Loring*, 91 feet in length, with 20-foot beam and electrically driven auxiliaries, was received at the station July 1, 1930. This tug replaced the old steam tug *Waterhouse*, which was sold. The other boat attached to the station, the *Townsend*, is also of Diesel construction, and since there has been observed a notable economy, both as regards fuel consumption and in operating personnel.

Brunswick, Ga.—Acting Asst. Surg. H. M. Branham in charge. Post-office and telegraphic address, Brunswick, Ga.

The foreign commerce entering this port consisted for the most part of cargoes of sugar from Cuba, crude oil from Mexico, and fertilizing material from Chile and Germany. The vessels engaged in this trade, with but few exceptions, were well kept and practically rat free. No quarantinable diseases were encountered during the year.

Cape Fear, N. C.—Acting Asst. Surg. J. Arthur Doshier in charge. Post-office and telegraphic address, Southport, N. C.

Foreign commerce entering this port during the year was very light, but 51 vessels arriving during that period requiring inspection. These vessels were, for the most part, from the west coast of South America, the West India Islands, and European ports, with miscellaneous cargoes. All fumigations at this port are made with sulphur, 10 such fumigations being performed during the year.

Charleston, S. C.—Senior Surg. C. M. Fauntleroy in charge. Post-office and telegraphic address, Charleston, S. C. Administrative headquarters and detention facilities are maintained at the station located on James Island about 10 miles by roadway and about 3 miles by water from the city of Charleston.

The majority of vessels calling at this port are coastwise and therefore not subject to inspection unless there be quarantinable disease on board. The few vessels which arrive from foreign ports requiring inspection arrive principally from ports in Europe and South America. One vessel carrying fruit cargo operates on a regular weekly schedule from ports in Central America. The cargoes received direct from foreign ports consists of nitrates from South America and general cargo from European ports.

Owing to the established practice of performing ship fumigations while at anchor in the open stream, sulphur fumigations have been done for the most part; however, it is occasionally practicable to fumigate vessels while lying at the wharves at Charleston, in which case the fumigant used is Zyklon-B.

Columbia River, Oreg.—Acting Asst. Surg. R. J. Pilkington in charge. Post-office and telegraphic address, Astoria, Oreg.

The great majority of vessels calling at Astoria are freighters. A number of combined freight and passenger vessels make this a port of call, but for the most part these vessels have received the necessary quarantine treatment at a prior United States port. Only two passengers arrived on vessels requiring inspection; 2,703 members of crew were examined.

During the fiscal year 47 vessels arrived from foreign ports and were inspected. Of this number, 31 were Japanese vessels. Twenty of these vessels were fumigated—2 with sulphur and 18 with Zyklon-B.

Coos Bay, Oreg.—Acting Asst. Surg. Everett Mingus in charge. Post-office and telegraphic address, 129 Broadway, Marshfield, Oreg.

All fumigations at this port are made with sulphur. As there are no service facilities available for the performance of this work at this station, the work is performed by the Independent Stevedore Co. The vessels entering this port are of steel construction and are in very good sanitary condition. No foreign commerce entered this port during the year. The chief export products were lumber and logs.

Corpus Christi, Tex.—Acting Asst. Surg. M. J. Perkins in charge. Post-office and telegraphic address, Corpus Christi, Tex.

There has been practically no foreign commerce entering this port during the year, but 45 vessels arriving during that period requiring inspection. The principal exports consist of cotton, lead, and sulphur. There is also a moderate amount of coastwise shipping of merchandise. No quarantinable diseases were encountered during the year.

Cumberland Sound, Fla.—Acting Asst. Surg. D. G. Humphreys in charge. Post-office and telegraphic address, Fernandina, Fla.

The foreign commerce entering this port consists principally of vessels from European ports calling for phosphate cargoes. All entered coastwise with the exception of four, which were required to undergo inspection, one of these being fumigated for the destruction of rodents. Because of their construction and the nature of their cargoes, these vessels presented but slight quarantine risks, and no quarantinable diseases were encountered.

Eastport, Me.—Acting Asst. Surg. John E. Brooks in charge. Post-office and telegraphic address, Eastport, Me.

The majority of vessels calling at Eastport are small freighters from Canada, which are not required to undergo quarantine inspection. But one vessel arrived during the year from foreign ports requiring inspection—a Norwegian steamship, which was inspected and given free pratique.

Fall River, Mass.—Acting Asst. Surg. Thomas Cox in charge. Post-office and telegraphic address, 1244 Pleasant Street, Fall River, Mass.

During the fiscal year ended June 30, 1931, a total of 62 vessels arrived. The crews of these ships numbered 2,205 persons; five passengers were carried. These ships were all oil tankers sailing chiefly from Curacao, Dutch West Indies, and owing to the character of the cargo the attending quarantine risks were slight.

Fort Monroe, Va.—Medical Director J. W. Kerr in charge. Post-office and telegraphic address, Fort Monroe, Va.; hospital and detention barracks, Craney Island, Norfolk, Va.

This station serves vessels entering Hampton Roads destined for Norfolk or Newport News, Va. Boarding is done at Fort Monroe; whenever necessary subsequent inspections are made at wharves at Norfolk, Newport News, and Berkley. Sulphur fumigations are performed at Fort Monroe and cyanide fumigations at the respective wharves.

During the year 369 vessels from foreign ports were inspected on arrival. On account of the world-wide financial depression, international commerce was much diminished. A total of 76 vessels were fumigated to destroy rodents and 9 were inspected and granted deratization exemption certificates. The number of rodents recovered after fumigation is becoming progressively less, indicating that the measures taken under the international sanitary convention of Paris, 1926, are becoming more effective. A total of 237 passengers and 13,728 seamen were inspected. There were no quarantinable diseases among them.

During the year the reconditioning of the *Argus*, which was delivered at the Fort Monroe quarantine station during the preceding fiscal year to replace the station ship *Chase*, which had become unseaworthy, was completed, and this vessel is now well suited to the needs of the station.

During the year the Engineer Corps of the Army pumped dredgings over the island to a depth of several feet, and upon completion of the riprapping of the shore line, for which provision has been made, it will be practicable to fill up low places on the quarantine grounds proper, thus making the surface of the entire island a uniform height.

Galveston, Tex.—Acting Asst. Surg. Fleetwood Gruver in charge. Post-office and telegraphic address, Galveston, Tex.

The quarantine station at Galveston is situated about 2 miles from the city, at the extreme end of Pelican spit, on filled land. This point is inclosed on the north, east, and part of the west sides by a riprap of granite cubes which form an admirable breakwater. On the remaining part of the west side is a fill of gravel and loose rock to a height of from 2½ to 3 feet. On the east side of the station is a wharf about 125 by 10 feet, set on piles, about 25 feet from the riprap retaining wall and parallel to it. This wharf is connected to the grounds by a small wooden bridge which approaches immediately in front of the office building. A steel bulkhead extends from the southeast corner of the station grounds to the Coast Guard station reservation, a distance of about 2,300 feet. Behind this bulkhead, dredgings from the channel are pumped, and it is expected eventually that the low land between the station and the Coast Guard property will be filled.

All vessels arriving from foreign ports destined for Galveston or places on the Houston Channel anchor in the Roads, a distance of 1½ to 2 miles, and are visited there by the medical officer and given the necessary quarantine treatment.

During the past year there has been a perceptible decrease in the number of vessels arriving from foreign ports, 711 during the fiscal year 1931, as compared with 804 during the fiscal year 1930. A total of 103 vessels was fumigated during the year; this was also a decrease as compared with the last fiscal year. One thousand four hundred and six passengers and 26,282 seamen were examined.

Georgetown, S. C.—Acting Asst. Surg. Olin Sawyer in charge. Post-office and telegraphic address, Georgetown, S. C.

During the fiscal year 10 vessels entered the port of Georgetown direct from foreign ports. Other vessels arriving at this port were either engaged in coastwise shipping or had landed at other American ports prior to entry at this port and consequently had received the necessary quarantine treatment prior to arrival here. Of the vessels arriving from foreign ports, 4 were American, 4 British, and 2 Norwegian. The Norwegian ships were new, motor driven, and built of steel, and the others were sailing and motor-driven vessels. All these vessels arrived empty for the purpose of taking on cargoes of lumber and showed few rat harborages. The crews manning these ships numbered 148 persons. No quarantinable diseases were encountered.

Gulfport, Miss.—Acting Asst. Surg. C. A. Sheely in charge. Post-office and telegraphic address, Gulfport, Miss.

Quarantine inspections are conducted in the channel off Gulfport and the detention station at Ship Island is maintained under the charge of a caretaker.

During the year 31 vessels from foreign ports were inspected. No quarantinable diseases were encountered.

Jacksonville, Fla.—Acting Asst. Surg. R. S. Wynn in charge. Post-office and telegraphic address, Jacksonville, Fla.

There has been a slight decrease in the total number of vessels inspected during this fiscal year; also a slight decrease in the number of vessels fumigated. The station is located at the United States Army Engineers dock, and the service is allowed the use of their facilities and equipment at this dock.

The foreign commerce entering this port consists principally of fertilizer material. Quite a number of the schooner type of vessel enters this port from Central and South American ports. During the year a total of 146 vessels arrived from foreign ports and were inspected, 19 of this number being fumigated. No quarantinable diseases were encountered during the year.

Key West, Fla.—Acting Asst. Surg. J. Y. Porter, jr., in charge. Post-office and telegraphic address, Key West, Fla.

Boarding of vessels is done both in the stream and at dock; seaplanes are inspected where they alight, and land planes are inspected at the Meacham Airport, located on the southeastern part of the island of Key West. Vessels

arriving at this port are mainly steamships and yachts from Cuba, the former bringing fruit and merchandise; small schooners from Central America and Cayman Islands, bringing fruit and turtle; steamships in ballast from Europe, coming in for bunkers and orders; and occasionally yachts from the Bahama Islands. The majority of vessels are of the modern steel-hull type, with slight rat harborages and practically no rat infestation. The schooners, however, are of wood and afford extensive harborage for rats. Fumigations are performed with sulphur and are accomplished in the stream.

One case of smallpox arrived from the Cayman Islands during the year. The vessel was detained, routine fumigation was performed, and the crew was vaccinated.

Two seaplanes, from Habana, Cuba, carrying no alien passengers or crew, arrived at this port during the year. No quarantinable diseases were encountered on these planes.

Marcus Hook, Pa.—Medical Director C. W. Vogel in charge. Post-office and telegraphic address, Marcus Hook, Pa.

The quarantine station at Marcus Hook, Pa., is the boarding and detention station for Philadelphia, Chester, Marcus Hook, Wilmington, and other ports on the Delaware River. Additional detention facilities are maintained at Reedy Island. The quarantine station is situated on the west bank of the Delaware River, about 18 miles below Philadelphia. The medical officer in charge of the quarantine station at Marcus Hook is also in administrative charge of the office for the fumigation activities of the service located in the customhouse, Philadelphia. He is also in charge of the medical examination of aliens for the port of Philadelphia, with a medical assistant in Philadelphia and one at the immigration station at Gloucester, New Jersey.

During the year the United Fruit Co. instituted a passenger service to this port, and in the future one of their large vessels will call at Marcus Hook on the voyage to New York from the West Indies and South American ports. A total of 887 vessels, carrying 2,182 passengers and 33,048 crew, arrived during the fiscal year and were inspected. No quarantinable diseases were encountered.

Miami, Fla.—Surg. Carl Michel in charge. Post-office and telegraphic address, 1001-1005 Newstower Building, Miami, Fla.

The majority of vessels entering this port are from the West Indies, and during the winter months a great many private yachts are entered. The number of vessels inspected during the fiscal year was 793, an increase of 77 over the past fiscal year. As there is no anchorage available at this port, inspection of vessels is made at the various docks about the harbor. The number of freight vessels arriving at Miami is very few, and consequently the quarantine risks are reduced to a minimum. Passengers arriving on vessels at this port are for the most part American tourists and comparatively few aliens were inspected during the year.

The port of Miami may be considered a growing port, and a gradual yearly increase in quarantine activities is anticipated here. The need for a new quarantine station at Miami has been apparent for many years, and for this purpose the War Department has transferred to the Treasury Department approximately 14 acres of land on Fishers Island as a site for a new quarantine station. Work on the building of this new station is now in progress.

In addition to the inspection of arriving vessels at Miami, the medical officer also inspects all airplanes arriving at that port from foreign ports. These inspections are performed in a special designated quarantine area immediately after landing. The passengers carried by these planes are of the better class, corresponding to the first and second class passengers on large liners; the number of such passengers arriving at Miami during the year was 7,361, which was an increase over the preceding year. The number of planes totaled 1,480, a slight decrease as compared with the year 1930. No quarantinable diseases were encountered on these planes; and as a special precaution against the introduction of smallpox into the United States, all employees of the Pan American Airways were vaccinated against smallpox.

Mobile, Ala.—Passed Asst. Surg. R. E. Bodet in charge. Post-office and telegraphic address, Mobile, Ala.

Vessels arriving at this port requiring inspection are boarded under way in the main channel and allowed to proceed to Mobile while undergoing inspection. Fumigations are performed at the various wharves in the harbor after the vessels have discharged their cargo, except when a preliminary fumigation is necessary. The lack of a suitable dock at the station alongside of which vessels requiring quarantine treatment or detention could be tied up tends to

detract from the efficiency of operation, but the construction of such a station wharf is contemplated.

The majority of vessels entering Mobile are steel-hulled steamships, many of which are of rat-proof construction. A small trade is carried on by sailing vessels with the Cayman and West Indian Islands; these vessels are not rat proofed. The principal imports are bananas, quebracho and quassi woods, coconuts, newsprint paper, sodium nitrate, kanite, bauxite, fertilizer, cane sugar, molasses, ammonium chloride, manganese ore, and jute bagging. Steamship service from Mobile includes trade with the West Indies, Mexico, Central and South America, Europe, the Philippines, India and the Orient, the north coast of Africa, and South Africa.

During the year no quarantinable diseases were encountered, but one vessel from Rio de Janeiro arrived with two seamen who had an elevated temperature. The two cases were removed to the station hospital, the crew were detained at the station, and the vessel was fumigated and allowed to discharge cargo under supervision. It was determined that the cases were not yellow fever, and as no elevation of temperature appeared among other members of the crew, the crew and vessel were released.

Sulphur as a fumigant has been largely replaced by the use of the hydrocyanic-acid preparation, Zyklon-B and HCN discoids. Fumigations late in the day, when the use of hydrocyanic-acid gas might be dangerous, are done with sulphur or with a combination of sulphur and cyanide. Rodents recovered after several mandatory fumigations were examined but none showed evidence of plague.

During the year a total of 242 vessels were inspected, 52 were fumigated, and 20 exemption certificates were issued.

New Bedford, Mass.—Acting Asst. Surg. E. F. Cody in charge. Post-office and telegraphic address, 105 south Sixth Street, New Bedford, Mass.

Vessels arriving at this port during the year numbered 8, comprising 4 American yachts (3 returning from Bermuda and 1 from a world cruise) and 4 packets in the Cape Verde trade. The packet boats were fumigated after discharge of cargo. No quarantinable diseases were encountered.

New Orleans, La.—Surg. T. J. Liddell in charge. Post-office and telegraphic address, room 305 Customhouse, New Orleans, La.

The new quarantine station in course of construction on the site acquired by the Treasury Department in 1927 is nearing completion and will be one of the most modern and up-to-date quarantine stations of the service. It is situated on the south bank of the Mississippi River, 3 miles below the Algiers landing of the Canal Street ferry. It is anticipated that this new station will be in operation about October 1, or shortly thereafter, when it will be possible to abandon the stations at Flood Street, in the city of New Orleans, and at Quarantine, La., near the mouth of the river, 90 miles below. The fumigation plant on Chartres Street and the administrative offices in the customhouse can also be moved to the new site and all activities combined at one place.

During the year a total of 318 vessels, with an aggregate tonnage of 883,222 tons and a cubic capacity of 115,713,493 cubic feet, were fumigated at this station. Various fumigants were used, but HCN discoids with 5 per cent chloropicrin as a warning gas have been adopted as the routine fumigant. About 20 per cent of the vessels are oil tankers, 40 per cent fruit vessels, and 40 per cent general cargo vessels, including about 4 per cent passenger vessels. From the South American ports the vessels usually carried petroleum and bauxite. From the Far East copra and hemp, and the around-the-world Japanese vessels carried passengers. From European ports the cargo was miscellaneous in character, and from the Central American ports the cargo was principally bananas.

One case of smallpox was removed from the American steamship *Parismina* and one case from the American steamship *Turrialba*. The sick men were placed in the station hospital at the lower quarantine station and held until they had recovered. All contacts were vaccinated and detained until vaccination was protective. Due to an outbreak of smallpox in a near-by Central American port the personnel of all vessels from that port were required to be vaccinated.

In accordance with the act extending the hours of quarantine inspection, the shipping and other port authorities have requested that 24-hour inspection service be granted the port of New Orleans. From June 1, 1930, to May 31, 1931, about 53 per cent of vessels arrived between 6 a. m. and 6 p. m. and about

47 per cent of vessels arrived between the hours of 6 p. m. and 6 a. m. Night inspection of vessels would be of special benefit to vessels with perishable cargo and passengers, also to tankers, as practically all of them proceed to ports above New Orleans, and consequently this class of vessels in many instances would gain about 12 hours by having night inspection.

New York, N. Y.—Medical Director Carroll Fox in charge. Post-office and telegraphic address, Rosebank, Staten Island, N. Y.

The administrative, boarding, inspection, laboratory, and fumigation headquarters of the station are located at Rosebank; the hospital and detention units are located at Hoffman Island, approximately 2 miles south of Rosebank. Swinburne Island remains inactive, but inspections of the property are made from time to time by officers from Rosebank. An office is also maintained in the customhouse, New York, for the issuance of port sanitary statements to outbound vessels; 14,858 such statements were issued during the fiscal year. Occasionally throughout the year an officer from the New York quarantine station is sent to Bridgeport, Conn., to inspect an incoming ship. An inspection station at Perth Amboy, N. J., is under the supervision of this station, as well as a station at City Island, N. Y., but the fumigation of arriving vessels, when required, is done from Rosebank.

The activities of the station are effected through the following divisions: (1) Boarding; (2) laboratory; (3) fumigation and ship inspection for rat infestation; (4) rat proofing of vessels; (5) hospital and detention—Hoffman Island; (6) personnel and accounts; (7) material; (8) buildings, grounds, and mechanical equipment; (9) floating property.

During the year, 4,258 vessels were inspected, including 7 at City Island, 3 at Bridgeport, and 76 at Perth Amboy. Of this number, 3,013 were granted free pratique and 1,245 were permitted to enter subject to the terms of provisional pratique. Of this latter group, 1,167 were reported to the fumigation division for disposition and 62 were required to hold parrots on board while in port. Twenty-seven Army and Navy vessels were passed on certificate from the ship's medical officer. The measures enforced abroad in connection with the inspection and embarkation of passengers from areas where typhus fever exists were materially modified toward the close of the year, with a resulting decrease in the number of passengers requiring removal from vessels for detention at Hoffman Island; 67 persons were deloused on board passenger vessels at quarantine.

The practice of assigning two medical officers from Ellis Island for the medical inspection of alien seamen and passengers on cargo vessels was discontinued very early in the year. The number of medical officers regularly assigned to boarding at this station was correspondingly increased from four to six. In cooperation with the Immigration Service, the medical inspection of alien passengers and seamen on cargo vessels has been carried on as before, and daily reports are made to the chief medical officer at Ellis Island. This unification of administrative control has been found very advantageous. A total of 966 alien passengers and 67,952 alien seamen arriving on cargo vessels were examined for immigration purposes during the year.

The boarding of vessels has been done with as little delay as possible, and there have been but few complaints of delay, except that incident to ships anchoring at night. It is anticipated that this delay will be taken care of by the additional hours of boarding, as contemplated under the act recently passed to extend the hours of quarantine inspection.

The laboratory has continued to examine for plague infection rats fumigated on ships, with negative results. Identification of rat fleas and identification of fleas from other stations has continued. The rat yield of vessels fumigated during the past year varies greatly with the yield of the previous year. This is due to the fact that steamship companies are using various agencies aboard to keep down the rat population, such as trapping, poisoning, private fumigations, and lastly but most important, the elimination of rat harborages and ratproofing.

Vessels arriving from ports on the Parana and Uruguay Rivers and from Dakar, Africa, are fumigated before discharge of cargo. In some instances, when deemed necessary, a second fumigation is performed. When the policy of fumigating loaded ships at San Francisco, which were destined for New York, was established, it was agreed to carry out a subsequent observation at New York by making rat infestation inspections and trapping whenever practicable. During the past fiscal year 21 vessels of this class were observed, one of which was particularly interesting on account of its rat infestation. Sixty-

seven rats were picked up during discharge of cargo; 15 rats were trapped, and 6 were killed with clubs. After leaving the port of New York this vessel sailed for Philadelphia, Boston, and Baltimore, and a total of 39 dead rats were picked up at these places during observation there.

Heretofore the inspection for rat infestation has always been made at the dock when the vessel was empty. Towards the end of the present fiscal year a new scheme was inaugurated, that of having the rat-infestation inspection made while the vessel was being given the regular quarantine inspection at the quarantine anchorage. By this procedure the boarding medical officer can receive the report of a sanitary inspector before the ship is released from quarantine, making it unnecessary to issue provisional pratique and fumigation order except when there are distinct indications for them. A total of 1,428 vessels were inspected on the bay and at the docks, resulting in postponement of fumigation of 966 vessels on account of absence of rat evidence.

The past year has been one of the most active in the history of the rat-proofing division, due to the extension of the work to foreign shipyards, as well as to the supervision of the large number of ships being constructed in American shipbuilding plants. It is now almost a universal procedure to include rat proofing as a standard requirement in all contracts for construction of new ships. During the year 23 new vessels that had carried out rat proofing during their construction were placed in commission. Of this number, 9 were built in American shipyards, 5 in those of Great Britain, 5 in Japan, 1 in Sweden, and 3 in Germany. There are now under construction 29 vessels on which a complete rat-proofing program is being carried out. Of these ships 18 are being constructed in the United States, 3 in England, 2 in Italy, 2 in France, 1 in Japan, and 3 in Germany. The rat-proofing specifications have been incorporated in the standard building contracts of the Navy Department, and was included in that of one of the new treaty cruisers that was awarded recently. Thirteen visits were made to eastern shipyards during the year to confer with technical personnel to demonstrate proper methods of rat proofing and to inspect such work as was being incorporated in the construction of new vessels. Numerous conferences were held with naval architects and representatives of shipping interests in New York relative to rat-proofing work. Included in this number were officials of the Italian steamship lines, the Cunard Line, one of the Dutch Far East companies, a Norwegian company operating a number of round-the-world freight and passenger vessels, and two of the Japanese steamship companies. Instruction in rat-proofing methods was given to eight medical officers of the service and four sanitary inspectors during the year. This work was demonstrated also to nine representatives of foreign countries, including health ministers of the Argentine Republic and of the Chinese Government, and a representative of the health section of the League of Nations. Four other Chinese medical officers were given instruction in rat-proofing work. Conferences were held with several manufacturers of insulating material which is used in the construction of refrigerating and air-cooled cargo compartments for the purpose of getting better results in the reduction of rat harborages in such sections. Practical tests were made of some of the asbestos material to ascertain if it was impervious to rat gnawing under working conditions. Further study will be devoted to this phase of the work.

The following data show the scope of the work of the rat-proofing division during the year:

Number of vessels touching at the port of New York being rat proofed.....	288	Number of flags represented, as follows—Continued.	
Number of steamship companies represented.....	47	Italian.....	8
Number of flags represented, as follows:		Spanish.....	8
American.....	111	Dutch.....	8
British.....	77	French.....	4
German.....	18	Chilean.....	3
Swedish.....	11	Danish.....	3
Norwegian.....	28	Republic of Panama.....	1
		Japanese.....	7
		Mexican.....	1
		Vessels of the U. S. Navy....	3

During the year 2,495 inspections and 67 rat-proofing surveys and 652 rat-infestation inspections were made by the personnel of the division.

Pensacola, Fla.—Acting Asst. Surg. C. W. D'Alemberte in charge. Post-office and telegraphic address, Pensacola, Fla.

The Pensacola quarantine station is situated 7 miles from the town of Pensacola, on Santa Rosa Sound. This station is maintained by two caretakers under the supervision of the medical officer in charge and is being held to accommodate such cases of quarantinable diseases and contacts as may be encountered at this port. The boarding and fumigation of vessels are done at Pensacola. All vessels entering this port requiring inspection are boarded and inspected at anchor 1 mile from shore.

The foreign commerce entering the port consists for the most part of steamships and an occasional sailing vessel. All rats destroyed by fumigation at this port are subjected to laboratory examination for evidence of plague. Fumigations are accomplished by the use of Zyklon-B. During the year a total of 60 vessels arrived at this port and were inspected, 11 of which number were fumigated.

Portland, Me.—Acting Asst. Surg. Albert F. Stuart in charge. Post-office and telegraphic address, Portland, Me.

During the fiscal year ended June 30, 1931, 111 steamers and sailing vessels were inspected at quarantine. These vessels carried 3,684 seamen and 91 passengers. Eleven vessels were fumigated for the destruction of rodents, and 18 dead rats were found following fumigation. No quarantinable diseases were observed during the year.

Portland, Oreg.—Passed Asst. Surg. F. S. Fellows in charge. Post-office and telegraphic address, 429 Mayer Building, Portland, Oreg.

Portland, Oreg., is the headquarters for quarantine operations along the Columbia and Willamette Rivers, and every effort is made to expedite local shipping. During the year 17 vessels were inspected and 12 vessels were fumigated. Three deratization exemption certificates were issued. In spite of the decreased foreign trade and the fact that several oriental shipping lines have made the Columbia River an intermediate rather than a primary port of call there were the same number of vessels, and 30 more seamen inspected at this station during the fiscal year ended June 30, 1931, as compared with the preceding year.

Port Townsend, Wash.—Surg. O. H. Cox in charge. Post-office and telegraphic address, Port Townsend, Wash. (Boarding and inspection station, Port Townsend, Wash.; hospital and disinfecting station, Diamond Point, Wash.)

The Port Townsend quarantine station serves all ports on the Puget Sound and its tributaries, the largest port being Seattle. All vessels subject to quarantine entering Puget Sound are boarded and inspected at Port Townsend. The majority of fumigations are performed at Seattle; a very small number were fumigated by sulphur while at anchor in Port Townsend Bay.

Providence, R. I.—Surg. H. G. Ebert in charge. Post-office and telegraphic address, room 403 Federal Building, Providence, R. I.

Foreign commerce entering this port consists of passenger vessels en route to New York from Mediterranean ports, Lisbon, Madeira, and the Azores group of islands; tankers from Aruba, Dutch West Indies, and Tampico, Mexico; colliers from Welsh and Russian ports; lumber ships from Leningrad and Archangel; two small schooners carrying passengers from Cape Verde Islands; and one schooner with salt from Grand Turk. Ninety-six vessels were inspected, of which 88 were given free pratique and 8 were allowed to dock under provisional pratique. On vessels subject to inspection, there were 6,466 members of crew and 5,577 passengers. No quarantinable diseases were encountered.

St. Andrews, Fla.—Acting Asst. Surg. W. J. Blackshear in charge. Post-office and telegraphic address, Panama City, Fla.

It is anticipated that shipping through this port will show a decided increase in the near future. An up-to-date dock and terminals have been completed and a large paper mill has been erected by the Southern Kraft Corporation. It is reported that there has already been listed for export in the fall and winter a large quantity of cotton. The amount of foreign commerce entering during the past fiscal year was very small, but seven vessels arriving from foreign ports requiring inspection, two of which number were fumigated.

Sabine, Tex.—Surg. W. A. Korn in charge. Post-office and telegraphic address, Sabine, Tex.

This station serves the ports of Sabine, Port Arthur, Port Neches, Beaumont, and Orange, Tex., and Lake Charles, La. The boarding, inspection, and fumigation of vessels is done at Sabine, while the general administration of

quarantine matters of the entire district are maintained in the Federal Building at Port Arthur, Tex.

On the new site for the quarantine station some of the old buildings and machinery used by the Union Sulphur Co. have been dismantled and removed. Two accidents occurred to the dock: First, a fire which burned the middle section, and, second, a collision of a Texas Oil Co. tanker with the dock, resulting in almost complete demolition of the dock and practically necessitating the building of a new dock.

Outbound cargoes from the port of Sabine consist of oil and oil products, lumber, wheat, and rice. Inbound cargoes are small lots of general merchandise. The vessels arriving at this port are chiefly tankers and consequently the quarantine risks are moderate. No vessels were detained on account of quarantinable disease.

San Diego, Calif.—Surg. J. W. Tappan in charge. Post-office address, San Diego quarantine station, Point Loma, Calif.; telegraphic address, San Diego, Calif.

No vessels carrying quarantinable diseases entered the port of San Diego during the year. A total of 626 vessels arrived. There were 283 fishing boats, which outfit in San Diego and fish off the coast of Mexico before their return, and 282 other vessels which came from Mexican ports. These latter were either excursion boats, yachts, or small cargo-carrying vessels with cargo for San Diego. Vessels from foreign ports, not including those from Mexico, numbered 43. This number includes intercoastal vessels, via the Canal Zone, which touched at foreign ports en route.

Beginning November 1, 1930, the routine inspection of airplanes from near-by airports in Mexico was discontinued. Airports thus involved were Ensenada, Tia Juana, Agua Caliente, and Mexicali. The quarantine risks from such travel were considered negligible.

The total number of vessels inspected at this port during the year totaled 607. These vessels carried 15,471 passengers and 18,278 members of crew. Three hundred and thirty-nine planes arrived from foreign ports and were inspected, together with 1,582 passengers carried on these planes.

San Luis Obispo, Calif.—Acting Asst. Surg. T. S. Long in charge. Post-office and telegraphic address, San Luis Obispo, Calif.

The port of San Luis, where quarantine inspections are made, is located in the town of Avila, 10 miles west of the city of San Luis Obispo. There are no facilities for carrying out quarantine treatment there.

Steamship service to and from this port is confined largely to oil tankers, operated for the most part by the Union Oil Co., and to a few small coasting vessels. Shipments of crude and fuel oils and gasoline amount to about 98 per cent of the total port traffic. Tankers operated by the Standard Oil Co. requiring quarantine inspection as a rule put into this port instead of Estero Bay, 15 miles north of San Luis Obispo, on account of inadequate boarding facilities at the latter place. A total of 12 vessels with 483 seamen were inspected and passed with no infectious or contagious diseases encountered.

San Francisco, Calif.—Surg. H. A. Spencer in charge. Post-office and telegraphic address, Angel Island, Calif.

Quarantine activities are administered from the station office, with a dock substation in San Francisco adjacent to the boarding tug. Fumigations, ship inspection for rat infestation, storing of fumigation equipment, and pertinent certificates are taken care of at that office. Vessels are boarded in the stream and at anchor. The principal commerce of this port is with the Orient. Vessels arrive from Europe, South America, and Mexico, but are, with very few exceptions, coastwise. The principal imports are silk, dried vegetable products, rice, oil cake, canned meats from Japan; vegetable oils, nuts, rice, tea, and minerals for use in manufacturing pottery from China; burlap, pig iron, steel, and fertilizer from India and Straits Settlements; copra, frozen rabbits, lumber, and oil cake from Australia; iron and steel manufactured goods, fertilizer, olive oil, glass, toys, and minerals used in tile, brick, and pottery from Europe.

The quarantine risks at this port are somewhat minimized by the time required in transit from the Orient, the presence of ship surgeons aboard all passenger boats and a decreased incidence of major quarantinable diseases in the ports visited. Vigilance, however, is continued, and a complete detailed sick report is required from every vessel carrying a medical officer. In addition, a careful inspection is made of all persons in the hospital or quarters when the ship arrives. Ship operators are becoming cognizant of the economic advantages of having competent medical personnel on passenger vessels. One company gives, when possible, a course of instruction to ship surgeons, stressing those features pertaining to quarantine and immigration problems.

The only quarantinable disease that arrived at the port during the year were two cases of smallpox. One, the American steamship *Manoa*, arrived on July 2, 1930, from Honolulu, Hawaii, with a passenger suffering from smallpox. All were vaccinated at sea by the ship surgeon on June 30. There were 82 passengers and 82 crew aboard. Reactions were read on July 2, and 64 passengers and 77 members of the crew were released. Fifteen passengers and five of the crew were revaccinated. The patient, six other passengers, and five members of the crew were detained at the quarantine station. The second, the American steamship *Tulsegas*, arrived from Seattle, Wash., on January 28, 1931, with a member of the crew sick from smallpox. The vessel proceeded to dock without quarantine inspection, the patient was placed in a local hospital, and the crew was granted shore leave as usual. Thirty-four members of the crew were eventually brought to the quarantine station, isolated, vaccinated, and released after developing reactions indicating immunity to smallpox. The quarters in which the patient lived was washed down with a 1-500 solution of bichloride of mercury under the supervision of a service officer. All bedding in the quarters was brought to the quarantine station and sterilized by steam under pressure. The vessel was not detained. No subsequent cases developed in either instance so far as known.

Restrictions on the importation of parrots have been enforced as provided by the Executive order and regulations promulgated thereunder. One hundred and four parrots have been detained at the station for the 15-day period required; 101 parrots and parrakeets were refused admission and were either killed or deported. No cases of psittacosis has been observed in either person or parrot.

Liquid hydrocyanic acid and Zyklon-B, both supplemented with chloropicrin, constitute the only fumigants used during the year. A total of 557 vessels were inspected, and 466 of this number were fumigated.

San Pedro, Calif.—Surg. H. E. Trimble in charge. Post office and telegraphic address, 111 West Seventh Street, San Pedro, Calif.

The administrative activities are performed in a suite of offices convenient to the water front. Ships arriving are reported by a marine lookout to the boarding officer in sufficient time for the quarantine tug to be alongside the vessel by the time it drops anchor. Customs, Immigration, Agriculture, and Public Health Service officers board simultaneously. A total of 1,428 vessels, with 59,593 crew and 11,031 passengers, received quarantine inspection during the year. The number of vessels fumigated decreased, owing to the increasing number of acceptable deratization certificates issued at foreign ports and to the greater number of deratization exemptions found justified upon inspection of vessels here. Many vessels stop for bunker oil only, and hence warrant remand to the port at which cargo is to be discharged. During the year 178 vessels were fumigated, all with Zyklon-B, and 319 deratization-exemption certificates were given after inspection.

The need of detention facilities at the port of San Pedro is felt, and an adequate site for a quarantine station is now available on Government-owned land in the harbor.

No aircraft requiring inspection arrived during the year, those from Mexico having stopped en route at ports of entry on the border. Facilities for inspection, however, are maintained at the Grand Central Air Terminal, Glendale, Calif.

Savannah, Ga.—Acting Assist. Surg. M. D. Hollis in charge. Post office and telegraphic address, Savannah, Ga.

This station serves the ports of Savannah and Port Wentworth; the latter is located about 5 miles west of Savannah. Vessels are boarded as they pass quarantine, about 14 miles down the Savannah River from Savannah and about 2 miles from its entrance into the Atlantic Ocean. The station is on Long Island, about 1 mile from a flag station on the Central of Georgia Railroad (Tybee branch).

During the year a total of 103 vessels arrived from foreign ports and were inspected, of which number 78 were given free pratique and 25 were subject to the terms of provisional pratique. About 35 per cent of the vessels arriving from foreign ports were of American registry and the remaining 65 per cent were of foreign registry, representing the following nations: Germany, 17; Norway, 17; British, 13; Denmark, 7; Sweden, 4; Italy, 3; Netherlands, 2; Japan, 2; Chile, 1; and France, 1. All fumigations are done with cyanide in the form of Zyklon-B, and vessels are held only about half the time that was

necessary in performing fumigations with other methods. A total of 20 vessels were fumigated for the destruction of rodents and 4 were inspected and granted deratization exemption certificates. A total of 3,679 seamen and 228 passengers were inspected under the quarantine laws. No quarantinable diseases were encountered.

There was an increase of 8 per cent in the number of vessels arriving during the fiscal year 1931, as compared with the fiscal year 1930; 67 of these vessels were bound for Savannah and 36 to Port Wentworth. A small per cent of them arrived from Chile, the United Kingdom, and North European ports. There were 11 vessels arriving from India, the Mediterranean, Peru, and other plague-infected ports, with cargoes of burlap, potash, nitrates, etc.

Considerable dredging of the Savannah River has been done by the Engineer Corps of the Army during the year in order that ships may have access to this port, some of the mud and sand being pumped around the quarantine station to fill in the low places and lessen the breeding of mosquitoes.

Seattle, Wash.—Medical Director L. D. Fricks in charge. Post-office and telegraphic address, 216 Canadian National Pier, Seattle, Wash.

Quarantine activities at the Seattle station during the fiscal year 1931 consisted for the most part, first, of the fumigation of vessels which have received quarantine inspection either at William Head, British Columbia, or Port Townsend, and, second, of the medical examination of alien seamen and passengers arriving on vessels which have been given quarantine inspection under the reciprocal agreement with Canada, at William Head, British Columbia.¹ During the year 154 vessels were fumigated at Seattle and five at Tacoma by the Seattle fumigating squad. All fumigations were performed with Zyklon-B. Seventy-nine of the vessels fumigated at this station during the year were trans-Pacific liners, which, under the quarantine regulations, are given fumigation at the termination of each voyage across the Pacific of approximately two months' duration. Sixty-four other vessels fumigated were in the mandatory class, and the majority of these were from oriental ports, but with irregular sailings. Fourteen vessels were given quarantine inspection at this station during the year, of which 4 were silk and passenger carrying vessels, which were allowed to pass Port Townsend at night and receive inspection at Seattle at sunrise the following morning. Seventeen vessels, which had received quarantine inspection at William Head under the reciprocal quarantine agreement with Canada, were boarded at Victoria and five were boarded at Vancouver by a medical officer from the Seattle quarantine station in order to make medical examinations of arriving aliens while en route to Seattle.

The rat-control program conducted in cooperation with the city health department of Seattle was under the supervision of the Seattle quarantine station, the rat-control force consisting of five trappers furnished by the city health department and two inspectors supplied by the Public Health Service. During the year 15,110 rats were trapped within the city, 476 dead rats were collected on board ship following fumigation, and 6,950 rats were necropsied at the rat laboratory for evidence of plague. Eighty-seven rats were trapped alive and examined for fleas, on which 183 fleas were collected. In addition to the rat-trapping program, 159 pounds of poison was distributed during the year.

During the year 590 airplanes, carrying 645 crew and 1,121 passengers, arrived at Seattle airports from foreign countries. All of these planes came from near-by Canadian ports. No medical inspections were made of the crews and passengers on these planes. The danger of the introduction of quarantinable diseases into this country through these persons is very slight.

South Bend, Wash.—Acting Asst. Surg. Francis W. Anderson in charge. Post-office and telegraphic address, South Bend, Wash.

Commerce through this port has been very light during the past year. However, considerable dredging is being done in the harbor by the Engineering Department, and it is anticipated that shipping will increase to some extent in the future. A large timber concern has taken over the three largest mills in the harbor, and as there is considerable timber to be shipped, the future should show an increase in the export trade. Another development at this port is the inauguration of trade with Japan in cedar squares, and to some extent spruce logs for veneer. Since the port dock has been completed, this trade has been the only source of foreign shipping, six vessels having arrived during the year, two of which were fumigated with sulphur.

¹ Practically all vessels entering Puget Sound pass Port Townsend quarantine station and stop there for quarantine inspection, thence proceeding to Seattle for fumigation after discharge of cargo.

Tampa, Fla.—Acting Asst. Surg. Percy Ahrons in charge. Post-office address, Tampa, Fla.; telegraphic address, St. Petersburg, Fla.

The Tampa Bay quarantine station is located on Mullet Key, 28 miles southwest of Tampa, at the entrance to Tampa Bay. This station serves the ports of Tampa, Port Tampa, and St. Petersburg. Arriving vessels are inspected at anchor off the quarantine station. Fumigation is carried on for the most part at the station dock, when vessels are not of too deep draft. It occasionally happens that vessels arrive at this station drawing 18 feet or more, in which event they are fumigated in the stream or allowed to proceed to Tampa to be fumigated before loading.

During the year, 228 vessels arrived at the Tampa Bay quarantine station and were inspected. The net tonnage of these vessels was 127,408. Of these vessels, 65 were fumigated with Zyklon-B, aggregating a total of 20,219,176 cubic feet of space fumigated.

The character of vessels and cargo entering this port has reduced the quarantine risk to a minimum. Docks where phosphate is loaded are of skeleton construction, on an island, with only railroad trestle connecting island with mainland. Docks where lumber is loaded is also of skeleton construction, on an island, with railroad bridge of trestle construction connecting the island with the mainland. Very few vessels take cargo at the municipal docks, which are on the mainland. These docks, however, are of recent construction and are recognized as rat proof. The dock where grapefruit is loaded is a modern, rat-proof structure.

West Palm Beach, Fla.—Acting Asst. Surg. J. H. Pittman in charge. Post-office and telegraphic address, West Palm Beach, Fla.

Practically all vessels entering this port are from the British West Indies, located about 70 miles from West Palm Beach. With the exception of private yachts, all are small boats with crews of about four in number. Occasionally a schooner enters this port for lumber.

The medical officer in charge at this station also has been designated to make the required quarantine and medical immigration examination incident to the arrival of aircraft at the officially designated airport of entry. These arrivals have increased the past fiscal year. Recently the Roosevelt Flying Service has inaugurated a weekly round-trip schedule to the Bahama Islands, taking in West End, Bimini, and Nassau.

MEXICAN BORDER STATIONS

TABLE 4.—Summary of quarantine transactions on the Mexican border for fiscal year ended June 30, 1931

Station	Number inspected from interior Mexico	Number of local passengers inspected	Total number of passengers inspected	Total number of persons disinfect	Total number of persons passed without treatment	Total number of persons vaccinated	Total number of sick held for observation	Total number of sick refused admission	Total pieces of baggage disinfected
Brownsville, Tex.....	3, 156	859, 813	862, 969	174	831, 935	1, 230	0	0	0
Calexico, Calif.....	0	9, 799	9, 799	0	9, 677	358	0	122	0
Columbus, N. Mex.....	294	8, 422	8, 716	0	8, 555	129	0	32	0
Del Rio, Tex.....	2, 229	112, 797	115, 026	1, 201	112, 836	980	0	9	649
Douglas, Ariz.....	5, 119	0	5, 119	0	0	534	7	0	0
Eagle Pass, Tex.....	8, 515	902, 938	911, 453	10, 841	902, 938	2, 654	0	88	126, 165
El Paso, Tex.....	7, 926	6, 035, 547	6, 043, 473	24, 560	6, 072, 529	7, 224	0	16	1, 456
Guadalupe Gate, Tex.....	498	498	498	0	0	359	0	0	0
Hidalgo, Tex.....	2, 928	330, 258	333, 186	47	331, 902	1, 214	17	3	5
Laredo, Tex.....	57, 330	1, 688, 483	1, 745, 813	1, 456	1, 728, 539	17, 274	190	0	2, 061
Minerva, Tex.....	0	1, 714	1, 714	0	1, 457	257	0	3	0
Naco, Ariz.....	34	3, 767	3, 801	0	3, 087	574	0	69	0
Nogales, Ariz.....	6, 869	22, 578	29, 447	12	28, 315	1, 110	8	2	13
Presidio, Tex.....	476	63, 436	63, 912	213	63, 123	565	0	11	344
Rio Grande, Tex.....	386	15, 518	15, 904	11	15, 244	649	0	0	932
Roma, Tex.....	3, 598	56, 768	60, 276	117	58, 291	1, 868	0	0	0
San Ignacio, Tex.....	59	147	206	0	97	109	0	0	0
San Ysidro, Calif.....	2, 823	8, 867	11, 690	0	10, 682	904	0	104	0
Sasabe, Ariz.....	0	431	431	0	352	77	0	2	0
Thayer (Mercedes), Tex.....	125	105, 532	105, 657	0	105, 252	401	0	5	0
Ysleta, Tex.....	0	61, 029	61, 029	0	0	312	0	0	0
Zapata, Tex.....	193	15, 700	15, 893	237	13, 449	1, 495	2	0	447
Total.....	101, 970	10, 304, 042	10, 406, 012	38, 869	10, 298, 260	40, 277	224	466	132, 072

QUARANTINE OPERATIONS ALONG THE MEXICAN BORDER

Traffic along the Mexican border has greatly increased during the past few years. The opening of new railroads, the construction of good roads, and the establishment of air routes from various points in Mexico is largely responsible for this increased traffic. The type of passenger carried on planes has been very good, a great number of whom are composed of American citizens or business men, and the quarantine risks from such travel is almost negligible. However, the journey by airplane in most instances being less than the incubation period for quarantinable diseases, it is very necessary to be on the alert to detect any possible cases that might arrive. Travel by automobile, also, has shown a decided increase. With the construction of good paved roads, an increasing number of persons are attracted to the United States to make purchases or for short visits. Economic conditions in the United States at the present time are no doubt responsible for the curtailment of immigration for permanent residence.

During the past year the Customs Service inaugurated the plan of keeping open for 24 hours daily the principal ports along the United States-Mexican border. This step, taken largely as a matter of the promotion of international comity, went into effect February 1, 1931. Because of the lack of funds and the consequent inability of the Public Health Service to provide additional personnel to take care of these added duties incident to 24-hour service, a rather heavy burden has been placed upon the quarantine officers on duty at these ports. To meet this emergency, night quarantine passes are given passengers after satisfactory examination, permitting those whom the quarantine officer believes to be not likely to become infected with quarantinable disease to return to Mexico, these quarantine passes being presented at the border upon their return.

As typhus fever and smallpox are the diseases most likely to be encountered at ports along the border, measures in force have been directed principally against their introduction. During the year a case with symptoms somewhat resembling typhus fever was reported in the city of El Paso, and at the request of the city health officers the Public Health Service delousing plant was opened for delousing certain contacts who were sent there, and their clothing was disinfected. Further investigation showed the case not to be one of typhus. The regular preventive measures, such as delousing when necessary, together with complete disinfection of the clothing and baggage, are always in force along the border. Every effort also has been made to prevent the introduction and spread of smallpox from Mexico, and the Mexican population are fast realizing the importance of vaccination and are cooperating in this respect to the greatest degree.

Clandestine crossing of the border continues, but probably due to the more severe penalty inflicted for illegal entry, or possibly because of the difficulty of finding employment in the United States, these crossings appear to be decreasing somewhat.

TRANSACTIONS AT INSULAR QUARANTINE STATIONS

TABLE 5.—Summary of transactions at insular stations for fiscal year ended June 30, 1931

Stations	Vessels in-spected	Vessels fumigated		Passengers in-spected	Crews in-spected	Bills of health and port sanitary statements issued
		Cyanide	Sulphur			
Hawaii:						
Ahukini.....	0	0	0	0	0	29
Hilo.....	12	0	0	12	471	209
Honolulu.....	179	6	0	35,788	26,802	727
Kahului.....	1	0	0	0	33	148
Kihei.....	0	0	0	0	0	10
Koloa.....	0	0	0	0	0	83
Lahaina.....	0	0	0	0	0	45
Mahukona.....	2	0	0	0	57	22
Makaweli.....	0	0	0	0	0	0
Total.....	194	6	0	35,800	27,363	1,263
Philippines:						
Cavite.....	11	0	0	178	1,721	1
Cebu.....	235	2	130	3,367	11,710	1,140
Davao.....	104	0	0	3,597	7,508	175
Iloilo.....	146	0	114	1,943	6,501	371
Jolo.....	42	0	0	1,692	1,689	65
Legaspi.....	7	0	0	8	332	27
Manila.....	1,326	74	164	90,413	118,852	1,580
Olongapo.....	0	0	0	0	0	0
Zamboanga.....	127	0	11	7,022	8,480	105
Total.....	1,998	76	419	108,220	156,793	3,464
Porto Rico:						
Aguadilla.....	3	0	0	2	129	69
Areceibo.....	1	0	0	0	29	34
Arroyo.....	2	0	0	0	60	30
Central Aguirre.....	1	0	0	0	7	19
Fajardo.....	46	0	0	4	233	326
Guanica.....	37	0	2	144	715	31
Humacao.....	21	0	0	0	312	55
Mayaguez.....	20	0	0	2	267	58
Ponce.....	104	2	0	23	2,859	99
San Juan.....	559	19	0	12,044	31,883	845
Total.....	794	21	2	12,219	36,494	1,566
Virgin Islands:						
Christiansted.....	5	0	0	0	39	190
Frederiksted.....	59	0	0	2,312	4,445	81
St. Johns.....	0	0	0	0	0	10
St. Thomas.....	254	7	9	1,151	8,508	553
Total.....	318	7	9	3,463	12,992	824
Alaska:						
Cordova.....	0	0	0	0	0	1
Juneau.....	0	0	0	0	0	0
Ketchikan.....	72	0	0	0	0	445
Seward.....	23	0	0	0	259	23
Sitka.....	18	0	0	1,335	1,636	18
Wrangell.....	0	0	0	0	0	0
Total.....	113	0	0	1,335	1,895	487
Total all stations.....	3,417	110	430	161,037	235,537	7,604

REPORTS FROM INSULAR QUARANTINE STATIONS

OPERATIONS OF THE SERVICE IN HAWAII *

Medical Director S. B. Grubbs in charge. Post-office address, Federal Building, Honolulu, Hawaii; telegraphic address, Honolulu, Hawaii.

Only one station equipped to carry on all of the quarantine activities is maintained in the Territory of Hawaii. In addition, vessels are inspected at the subports of Hilo, Mahukona, Ahukini, Koloa, Kahului, and Lahaina.

Ships call at Honolulu from most of the important ports of the world. Within the last year the Canadian Pacific Line has made Honolulu a port of call for some of its vessels plying between the Orient and Vancouver. More than half of the ships calling at this port carry both passengers and general cargo. The round-the-world tourist ships are the only ones which carry no freight.

On January 15 the American steamship *President Lincoln* arrived from Manila and oriental ports with a case of cerebrospinal meningitis in a Filipino steerage passenger. Ninety-six contacts among the steerage were removed from the ship and detained at the quarantine station for 15 days from the date of their last exposure to the infection. There were no secondary cases. A case of cerebrospinal meningitis was also reported on December 12 in a Filipino who had arrived in Honolulu from Manila, in steerage, eight days previously.

In compliance with the special regulations prescribed in accordance with Executive Order No. 5264, approved January 24, 1930, for the prevention of the introduction of psittacosis into the United States, shipments of birds were removed from three ships during the year and detained at the quarantine station.

On May 5, 1931, the surgeon of the British steamship *Empress of Canada* reported by radio a case of suspected plague in a Chinese member of the crew. This ship was from ports in China and Japan. The patient died two days prior to arrival at Honolulu. The vessel reached the quarantine anchorage on May 8. The vessel was detained at the anchorage, the body was removed, the crew and passengers were examined, and the vessel was inspected for rat harborage and infestation. The master was then permitted to proceed to the wharf under provisional pratique. Autopsy performed at the quarantine station showed no conclusive evidence of plague. There were no cases of suspicious illness among crew or passengers. There was some rat harborage, but no evidence of recent infestation. Most of the cargo was in closed wooden cases. The cargo was inspected to ascertain its freedom from rats both before discharge from the holds and on the wharf. The vessel proceeded to Vancouver. Laboratory examinations of specimens of the body, both cultures and inoculated animals, proved negative for plague.

The Japanese steamship *Chichibu Maru* arrived on May 14, 1931, with one case of leprosy in a Japanese steerage passenger. The patient was an alien. He was detained at the Kalihi Leprosy Receiving Hospital until deported by the immigration authorities on May 17.

During the year 194 vessels were inspected at ports in the Territory of Hawaii. These vessels carried a total of 35,800 passengers and 27,363 crew; of this number 35,788 passengers and 26,802 members of crew were inspected at the Honolulu quarantine station.

OPERATIONS OF THE SERVICE IN THE PHILIPPINE ISLANDS

Surg. R. W. Hart, chief quarantine officer. Post-office address, Box 424, Manila, P. I.; office, Customhouse; telegraphic address, Quarantine, Manila.

There are nine ports of entry in the Philippine Islands at which quarantine transactions are carried on. At the three principal ports—Manila, Cebu, and Iloilo—full-time quarantine officers are on duty; at Davao, Jolo, Legaspi, and Zamboanga part-time physicians act as quarantine officers; at Cavite and Olongapo, the two naval stations in the Philippine Islands, naval medical officers are detailed to act as quarantine officers.

Two fully equipped detention and disinfection stations are maintained for the islands. Of these, the largest is located at Mariveles, which is situated at the entrance of Manila Bay, about 30 miles from Manila. This station is used to serve the northern ports of the archipelago. The other station is located on the island of Kawit, near Cebu. It is kept in readiness for the handling of infected vessels entering the southern ports.

The quarantine service in the Philippine Islands carries out practically all the functions of the United States Public Health Service, such as the physical examination of aliens and the maintenance and operation of quarantine stations and floating equipment. Relief stations are maintained at the principal ports of entry and outpatient relief is furnished service beneficiaries by the medical officers of the service, in addition to their quarantine duties. The quarantine laws and regulations of the United States are in effect in the Philippines, having been made effective by presidential order of January 4, 1900, and later confirmed by the Administrative Code of the Philippine Islands, approved March 10, 1917. In addition, certain laws applying to local conditions have been enacted by the Philippine government. At the last session of the Eighth Philippine Legislature a specific act was passed making it unlawful for any person, corporation, or other entity to import or introduce into the Philippine Islands the virus of yellow fever or any substance which might be considered infected with the causative agent of yellow fever, or to experiment on such a virus or substance in the Philippine Islands. The passage of such an act was considered advisable in view of the presence in the islands in large numbers of *Aedes aegypti* mosquitoes, the vector of yellow fever, and the proved difficulty of controlling the infection even in experimental work in the laboratory.

Smallpox, cholera, and plague are being continuously reported as occurring in most of the countries within a few days' run of the Philippine Islands. The proximity of the islands to the foci of these diseases and the fact that rapidly traveling passenger vessels have brought these infected places much nearer the Philippines, has increased the quarantine responsibility. However, during the year under report no cases of quarantinable diseases occurred in the Philippines excepting leprosy, cholera, and cerebrospinal meningitis, none of which could be considered as imported. Cholera was present in the Visayas in epidemic form during the first half of the year

and sporadic cases occurred throughout the remainder of the year. This epidemic, however, can not be attributed to any recent importation, as past history shows that cholera recurs in epidemic form in these islands every four or five years and may be considered as endemic there. During the year, 4,848 cases of cholera with 3,109 deaths were reported. Twenty-five cases of cerebrospinal meningitis with 11 deaths were reported in the city of Manila during the year, but this disease was not reported from any other part of the islands.

During the year two vessels arrived at Manila, each with one case of smallpox on board. Both vessels were treated in accordance with the quarantine regulations, full advantage being taken of the immune reaction, thus shortening the period of detention of the vessel in quarantine. The patients, with their personal effects, were removed to San Lazaro Hospital. All persons on board were vaccinated against the disease and were detained on board under quarantine, inspection being made twice daily for the reexamination of personnel and the reading of vaccination reactions. In the case of one vessel the entire personnel showed immune reactions within 48 hours, and after disinfection of the infected compartment the vessel was released.

One vessel arrived in Manila on which one case of cerebrospinal meningitis had occurred in a member of the crew. The case had been removed from the ship at the port of Hong Kong, but on arrival at Manila five immediate contacts were removed from the vessel for detention in San Lazaro Hospital. Nasopharyngeal smears and cultures were taken on all members of the crew. No carriers were found in this group. The contacts removed to San Lazaro Hospital were detained for a period of 14 days, although no further cases developed among them.

During the year two interisland vessels, each with one case of cholera on board, were detained in quarantine. All passengers and members of the crew were detained for six days, although no further cases developed. Stool examinations for the vibrio were made on all those detained.

A total of 1,998 vessels carrying 265,013 persons were inspected on arrival at the various ports of entry in the Philippines during the year.

All steerage passengers arriving in the Philippine Islands were required to present positive evidence of vaccination against smallpox within one year of arrival or undergo vaccination. This was also required of all members of crews of vessels calling at Philippine ports. A total of 18,133 crew members of vessels entering Philippine ports were vaccinated against smallpox during the year. As most of the steerage passengers arriving in the Philippine Islands come from the ports of Amoy, Hong Kong, and Shanghai, practically none require vaccination upon arrival at Manila, since officers of the United States Public Health Service stationed at these ports inspect and vaccinate them prior to embarkation, noting upon each passenger's identification card the result of the vaccination. No steerage passenger is allowed to embark from any of these ports for the Philippines until he is known to be immune to smallpox, and upon arrival is required to produce this evidence of immunity in the form of an identification card initialed by the United States medical officer at port of embarkation.

INTERISLAND QUARANTINE

At the beginning of the fiscal year, cholera was present in epidemic form in several of the islands in the Visayas. There was also a minor epidemic in the city of Manila, some 50 cases occurring there. It reached such proportions that it was considered necessary to put interisland quarantine into effect against several ports. This was made effective at various times during the year for Manila, Cebu, Iloilo, the Province of Iloilo, the Province of Capiz, the island of Bohol, and the island of Samar. In accordance with the provisions of the international sanitary convention, the official representatives of all countries signatory to the convention were notified of the presence of cholera in the infected ports. In addition, certain restrictions were enforced at the ports in relation to all shipping, in order to minimize the possible infection of vessels calling at these ports or the spread of the disease to foreign ports through the agency of vessels having commercial relation with them. All vessels leaving the above-named ports or provinces during the time that they were declared infected with cholera were required to secure bills of health from the local sanitary authorities. All passengers and members of crews of vessels leaving infected ports were inspected immediately before departure and were required to produce evidence of vaccination against cholera within the preceding six months. These vessels were required to await quarantine inspection at all succeeding ports of call in the islands until a period of five days had passed. At the same time the shipment of low-growing fruits and vegetables liable to convey cholera was prohibited from infected ports.

A total of 472 incoming interisland vessels, 26,028 passengers, and 30,424 crew members were inspected during the period of quarantine against cholera, and 1,338 outgoing interisland vessels, 28,872 passengers, and 53,772 members of crews were inspected during this period; 71,809 persons were vaccinated against this disease by officers of the quarantine service. A total of 4,848 cases of cholera with 3,109 deaths were reported in the Philippine Islands during the year. All vessels in the interisland trade are required to be fumigated at least once every six months. During the year 355 interisland ships were fumigated, 1,347 rats were recovered after fumigation, and 1,108 crew members were vaccinated against smallpox.

OUTGOING QUARANTINE

All steerage passengers preparing to embark for the United States and Hawaii from the Philippines were required to undergo a short period of detention prior to sailing. Two separate detention camps were maintained. These camps, although conducted as private enterprises, are under the immediate supervision of the quarantine service. Daily inspections were made, not only of the passengers but of the sanitary condition of the camps. While in detention all prospective steerage passengers were vaccinated against smallpox and, during the presence of cholera in Manila, were also vaccinated against this disease. Nasopharyngeal cultures for meningococcus and stool examinations for cholera organisms were made on all of these passengers and those found to be harboring either cholera or menin-

gococcus were sent to the isolation hospital until free of organisms. During the year 9,450 outgoing passengers were vaccinated against smallpox, 9,450 stools were examined, and 9,648 nasopharyngeal cultures were made. Of this number, 261 were found positive for cholera and 149 for meningococcus.

It is of interest to note that during the year the percentage of cholera carriers among prospective outgoing steerage passengers was approximately 2.5 per cent, while during previous years when cholera was not present in epidemic form the percentage of carriers ran under 1 per cent. In the early months of the calendar year 1930, the percentage of cholera carriers ran about 0.64 per cent. This percentage gradually increased, and during the months of May and June, when clinical cholera began to be reported, the percentages were 1.62 and 2.33, respectively. This percentage gradually increased to 5.19 per cent during the month of September. It was during the months of July and August that the largest number of cases were reported. Following this, the number of cases gradually decreased and the percentage of carriers also decreased to 2.3 per cent, the carrier rate remaining at approximately this figure for the last six months of the year.

RAT PROOFING AND FUMIGATION

The effort of previous years to reduce the rat population in those areas adjoining the piers and quays was continued throughout the past year. This work, at the instigation of the quarantine service, was carried out by the local health authorities. During the year 56,504 rats were recovered and examined. No cases of plague-infected rodents were found.

During the year 495 vessels were fumigated at Philippine ports, from which 2,172 rats were recovered. All rats were examined in the laboratory. A large percentage of the fumigations were carried out at the port of Manila. Both sulphur and cyanide in the form of Zyklon-B were used in fumigating.

OPERATIONS OF THE SERVICE IN PORTO RICO

Surg. L. E. Hooper, chief quarantine officer. Post-office and telegraphic address, San Juan, P. R.

Quarantine inspections facilities are maintained at all ports of entry. San Juan is the principal port and headquarters of the quarantine service for the island. The administrative offices are conveniently situated in the city near all of the shipping interests. The quarantine station on Miraflores Island is equipped for hospitalization and detention purposes. Vessels are boarded and inspected at an anchorage in the bay. Fumigations are effected with Zyklon-B. There is also considerable shipping activity in Ponce, and adequate boarding and fumigation facilities are maintained at that port. Boarding inspection is provided at the subports of Aguadilla, Arecibo, Arroyo, Central Aguirre, Fajardo, Guanica, Humacao, and Mayaguez.

The majority of foreign vessels entering the ports of this island come from Europe. The Spanish Transatlantic Line passenger ships arrive bimonthly from Mediterranean ports and the Canary

Islands. These vessels are handled very carefully to prevent the possible introduction of plague. Their cargoes are usually vegetables in crates, and these are subjected to fumigation in covered lighters before they are permitted on the docks. Commerce with United States ports is very active. The New York & Porto Rico Line, Bull Insular Line, Red "D" Line, and the Lykes Line, from Galveston, maintain a regular service and carry passengers and general cargo. During the winter months many tourist ships making cruises in the West Indies call at San Juan. No quarantinable diseases were encountered during the year.

During the year, 189 airplanes from foreign ports arrived at designated air ports of entry in the vicinity of San Juan. There is a tri-weekly passenger and mail service between Miami, Fla., and San Juan. These planes call en route at Habana, Camaguey, Port au Prince, and Santo Domingo City. The New York, Rio & Buenos Aires (Inc.) ("Nyrba Line") has been taken over by the Pan American Airways (Inc.), and once each week a hydroplane of this line arrives in San Juan from Para, Brazil. These planes call at Paramaribo, Georgetown, Port of Spain, St. Lucia, Antigua, and St. Thomas. They are boarded and inspected at St. Thomas before arrival here. As they usually carry alien passengers, they are again inspected for immigration purposes at San Juan. The aliens traveling on these planes are all first-class passengers and are of good type.

OPERATIONS OF THE SERVICE IN THE VIRGIN ISLANDS

Passed Asst. Surg. E. H. Carnes, chief quarantine officer. Post-office and telegraphic address, St. Thomas, Virgin Islands.

The office headquarters are located in the business district of St. Thomas. The detention station is located at the harbor entrance, a distance of about 1 mile from the town of St. Thomas. While this is part of the mainland, the detention station may be reached only by water, no road having been built to the station.

Situated on or near the regular steamship lanes between the Panama Canal and European ports, St. Thomas, with an excellent harbor, furnishes an important refueling depot, and it is for the purpose of taking bunkers that most ships enter during the winter months. As these ships are in port only a few hours, quarantine inspection is expedited as much as possible in order that the tourists may spend all the time available ashore. During the winter months pleasure yachts are frequent visitors. Sailing vessels in the inter-island trade enter port during the entire year. The Pan American Airways System operates a weekly north and south bound plane through St. Thomas.

No quarantinable diseases have been encountered during the past year. Ships from the east coast of Brazil are subjected to close inspection, and the regulations to prevent the introduction of yellow fever are strictly enforced. The presence of yellow fever in Brazil is a potential source of danger to the Virgin Islands, as ships from Brazilian ports put into St. Thomas for bunkers where the *Aedes* index is high. Occasionally passengers from Rio de Janeiro and vicinity arrive in St. Thomas by seaplanes within the incubation

period of yellow fever. As these passengers are usually in transit they are not detained, but proceed within an hour or so after arrival by plane. Should such passengers land, however, it is contemplated that they will be kept under observation a sufficient time to complete the yellow fever incubation period.

Ships from plague-infected ports of South America constitute a large number of the ships entering, and strict surveillance of these ships while in port is maintained to see that all regulations relative to the prevention of the introduction of plague are complied with. These ships, in port for bunkers for a few hours only, usually with full cargo, are not fumigated, but are required to fend off 4 feet from the dock, apply standard rat guards on all lines, raise or light and guard gangways at night, and, in the case of ships from badly infected ports, are not allowed alongside the wharves after night-fall. The docks and warehouses are so constructed as to afford but slight harborage for rats. Zyklon-B is used as the fumigant in the case of steamships, while sulphur is used for small sloops and schooners.

During the year 254 steamships and 63 aircraft with total crews of 8,854 and 1,357 passengers received quarantine inspection at the port of St. Thomas. At the subports of Frederiksted and Christiansted 64 ships received quarantine inspection, with total crews of 4,484 and 2,312 passengers. A total of 659 bills of health and 165 sanitary statements were issued at the three ports.

TRANSACTIONS AT FOREIGN PORTS

TABLE 6.—Summary of transactions at foreign ports

Station	Vessels inspected	Fumigation of vessels supervised	Passengers and crews inspected		Bills of health countersigned
			Passengers	Crews	
Amoy, China.....	96	0	17,608	9,498	118
Guantanamo Bay, Cuba.....	1,174	0	0	0	174
Guayaquil, Ecuador.....	48	0	0	0	262
Habana, Cuba.....	1,689	79	130,019	181,921	1,689
Hong Kong, China.....	357	0	24,195	53,213	597
Progreso, Mexico.....	132	1	366	4,759	132
Puerto Mexico, Mexico.....	0	6	10	0	85
Shanghai, China.....	375	13	4,065	6,240	802
Tampico, Mexico.....	470	18	409	18,815	432
Vera Cruz, Mexico.....	298	10	7,348	21,998	298
Mexico City, Mexico.....	0	0	0	0	0
Total.....	3,639	127	184,020	296,444	4,589
EUROPEAN PORTS					
Antwerp, Belgium.....	74	38	5,290	0	861
Belfast, Ireland.....	0	0	3,000	0	111
Bremen, Germany.....	0	93	14,616	0	486
Cobh, Irish Free State.....	0	0	11,057	0	149
Copenhagen, Denmark.....	0	0	940	0	215
Danzig, Free City.....	108	0	17,436	388	20
Dublin, Ireland.....					60
Galway, Irish Free State.....					
Genoa, Italy ¹	30	30	2,929	0	332
Glasgow and Grenock, Scotland.....	0	0	5,578	0	346
Bergen, Norway ⁴	0	0	279	0	20
Goteborg, Sweden.....	20	0	5,690	0	76

¹ Navy transports only.² Does not include 45 airplanes and 169 vessels passed without inspection.³ Began Oct. 1, 1930.⁴ Began Dec. 8, 1930.

TABLE 6.—Summary of transactions at foreign ports—Continued

Station	Vessels inspected	Fumigation of vessels supervised	Passengers and crews inspected		Bills of health countersigned
			Passengers	Crews	
Hamburg, Germany.....	2	232	22,229	0	903
Liverpool, England.....	0	0	13,617	0	540
London, England.....	0	0	1,124	0	598
Londonderry, Ireland.....	33	0	2,808	0	0
Naples, Italy.....	136	1	35,220	11,908	265
Oslo, Norway.....	0	0	4,960	0	109
Palermo, Italy.....	0	0	1,017	0	100
Patras, Greece ¹	22	0	2,926	4,967	22
Piraeus, Greece (Athens).....	30	0	3,183	2,944	70
Rotterdam, Holland.....	38	69	4,536	0	563
Southampton, England.....	0	0	22,739	0	490
Stockholm, Sweden.....	0	0	0	0	99
Total.....	493	463	181,174	20,267	6,435
Total, all stations.....	4,132	590	365,194	316,711	11,034

¹ Discontinued Feb. 28, 1931.

REPORTS FROM FOREIGN PORTS

AMOY, CHINA

Acting Asst. Surg. R. Hofstra in charge. Post-office and telegraphic address, care American Consulate, Amoy, China.

Health conditions in Amoy during the fiscal year 1931 have been fairly satisfactory. An epidemic of plague was reported in cities in the vicinity of Amoy, approximately 1,500 deaths being reported during the months of June and early part of July, 1931. It is estimated that about 1 or 2 per cent of these cases were of the pneumonic type. Only one case, however, was reported in the city of Amoy.

The Chinese National Quarantine Service is performing the vaccination of passengers going to Manila; also the inspection of outgoing vessels.

During the fiscal year 1931, 96 vessels were inspected, the crews on which totaled 9,498 and passengers 17,608; 118 bills of health were countersigned.

GUANTANAMO BAY, CUBA

Acting Asst. Surg. C. W. Carr in charge. Post-office and telegraphic address, care United States Naval Station, Guantanamo Bay, Cuba.

Guantanamo Bay is a naval port only, and at the request of the Navy Department a medical officer attached to the naval station at Guantanamo Bay is appointed as an acting assistant surgeon in the United States Public Health Service to act as quarantine officer for the purpose of signing bills of health for vessels departing from the naval station at that place, as no American consul is stationed there.

No passenger vessels, other than United States Navy transports, entered port, and no commercial vessels stopped here, except those required to put into port because of emergency. No quarantinable diseases were encountered.

GUAYAQUIL, ECUADOR

Acting Asst. Surg. Carlos V. Coello in charge. Post-office and telegraphic address, care American Consulate, Guayaquil, Ecuador.

During the fiscal year ending June 30, 1931, there were issued 262 bills of health to vessels departing from the port of Guayaquil, corresponding to 48 ships inspected, 169 passed without inspection, and 45 airplanes passed without inspection; all of these were bound for the United States or to the Canal Zone, directly or via some port in South America.

Guayaquil and its vicinity has been free from plague since March, 1930, but this disease exists in several small villages in the interior of the country.

However, the intensive deratization campaign, started in September, 1929, by the local health authorities, with the assistance of a representative of the Pan American Sanitary Bureau, is still being carried out. This campaign has been productive of very good results.

HABANA, CUBA

Surg. D. J. Prather in charge. Post-office and telegraphic address, care American Consulate, Habana, Cuba.

The work of this office in brief is as follows: (1) The countersign bills of health issued by the consul general of the United States to vessels going to the United States and its dependencies, either direct or via foreign ports (these bills of health are delivered to the vessel at the last moment after all the requirements have been complied with); (2) to report the sanitary condition of the city and port and, if possible, the surrounding country; (3) to supervise the fumigation of vessels bound for United States ports when necessary; (4) to inspect vessels, cargoes, crews, and passengers bound for United States ports when necessary.

The vessels fumigated in this port are divided into two classes: (1) Vessels fumigated by the service; these include vessels going direct to the United States or its dependencies that are fumigated to comply with the United States quarantine regulations; (2) vessels fumigated by the Cuban quarantine officers under the supervision of the service; these include vessels that require fumigation by the Cuban quarantine regulations and intend going to the United States, usually via Cuban ports.

During the fiscal year, 1,689 bills of health were issued at this port—total crews, 181,921; total number of passengers, 130,019. There has been a decrease in the number of bills of health countersigned, possibly as a result of the worldwide depression in shipping. There were no cases of quarantinable or other communicable diseases during the year either in Habana or in the Republic of Cuba.

HONG KONG, CHINA

Passed Asst. Surg. A. P. Rubino in charge. Post-office and telegraphic address, care American Consulate, Hong Kong, China.

Particular attention has been given throughout the year to the examination of steerage passengers embarking for the United States and its dependencies, and to the inspection of steerage accommodations aboard the vessel. The detention of steerage passengers in camps and the laboratory examination for possible meningococcus carriers were discontinued. However, applicants called at this station daily for notation of type of reaction to smallpox vaccination and reported for meningitis clearance within 24 hours before sailing and underwent inspection aboard the vessel. One case of meningococcus meningitis occurring among the European crew was removed from an American vessel bound for Manila.

During the fiscal year, 597 bills of health were issued and 357 vessels were inspected prior to sailing. The number of cases of smallpox reported was 14, with 8 deaths; and 22 cases of meningococcus were reported, with 12 deaths. Practically all cases occurred among the Chinese population.

MEXICO CITY, MEXICO

Surg. H. F. Smith in charge. Post-office and telegraphic address, care American Consulate General, Plaza de la Reforma No. 2, Mexico City, Mexico.

A service officer was detailed to the consulate general, Mexico City, during September, 1930, for the purpose of carrying out the provisions of the quarantine act of February 15, 1893, and the immigration act of February 5, 1917. Owing to the delay in the arrival of equipment and the necessity for making arrangements pertaining to suitable office quarters, actual operations were not begun until December, 1930.

There was a considerable increase in the number of cases of typhus fever reported in Mexico City during the first six months of 1931 as compared with a similar period for each of the three preceding years; 548 cases of typhus, with 239 deaths, were reported as occurring during the period from January 1, 1931, to June 30, 1931. Of this total, 215 cases with 75 deaths were reported for the month of March. The majority of the cases are reported as having occurred within two fairly well circumscribed sections of the city. Since the inauguration of service activities in Mexico City, special attention has been

given to the examination of applicants for immigration visas with reference to determining the residential section of the city whence such applicants come and their freedom from vermin infestation.

A total of 288 cases of smallpox with 134 deaths were reported as occurring for the year under report. The monthly distribution of the cases and deaths reported was fairly uniform. With the exception of the increase in the reported incidence of typhus fever and the customary occurrence of smallpox, no quarantinable diseases were reported by national health organizations as occurring within the Republic.

PROGRESO, MEXICO

Acting Asst. Surg. C. E. Athey, in charge. Post-office and telegraphic address, care American Consulate, Progreso, Mexico.

The Public Health Service officer attached to the United States consulate at the port of Progreso, inspects vessels prior to their departure for United States ports and sees that the sanitary conditions pertaining to such vessels while in port are satisfactory before countersigning the bills of health; he inspects the crew and passengers on such vessels and takes their temperature prior to departure. During the past fiscal year, he inspected 132 vessels, 360 passengers, and 4,759 members of crew.

The amount of shipping at this port has decreased considerably during the past fiscal year. This may be accounted for to a large extent by the constant decrease in the shipping of henequen. Health conditions at this port have been fairly good.

PUERTO MEXICO, MEXICO

Acting Asst. Surg. J. J. Sparks in charge. Post-office and telegraphic address, care British Consulate, Puerto Mexico, Mexico.

Health conditions for the port of Puerto Mexico have been very good during the past year. Generally, there has been an improvement in local sanitary conditions; the water supply has been greatly improved and much has been done toward filling in the swampy areas surrounding the town. The sanitary conditions in the oil camps of the surrounding country are fairly good and the amount of malaria is comparatively low. During recent years, much has been done by the State authorities, in conjunction with the Rockefeller Foundation, regarding the diagnosis and treatment of hookworm.

The vice consulate at this port was closed during the fiscal year 1928, and the Public Health Service officer has, since that date, issued bills of health to departing vessels. The total number of such bills of health issued during the current fiscal year was 85.

SHANGHAI, CHINA

Acting Asst. Surg. Thomas B. Dunn in charge. Post-office and telegraphic address, care American Consulate, 1 Canton Road, Shanghai, China.

Health conditions in Shanghai, as regards cerebrospinal meningitis, has improved somewhat during the past year. This disease has been quite prevalent in the interior of China, but much milder in type. There have been no meningitis patients taken from ships in Shanghai. Health conditions as regards cholera in Shanghai also were greatly improved. Previously, at the request of the Philippine quarantine service, stool cultures were taken on all passengers and crew destined for the Philippines; but during the past year, because of the decreased number of cases of this disease, no stool cultures were taken. During the last two years the Chinese municipal authorities of Greater Shanghai, the International Settlement, and the French Municipal Council have given a great number of cholera vaccinations. There were two cases of typhus fever reported in Shanghai during the year. Smallpox, however, was much less prevalent, but vaccination of all steerage passengers embarking at Shanghai and crews passing through Shanghai for the Philippines continue to be vaccinated prior to sailing.

TAMPICO, MEXICO

Acting Asst. Surg. W. J. Lynn in charge. Post-office and telegraphic address, Comercio 52, Oriente, Tampico, Mexico.

During the fiscal year ended June 30, 1931, 470 vessels cleared from this port through the American consulate for the United States, of which 180 were cargo boats, 54 passenger ships, and 236 tankers. Of these vessels, 213 were of American registry. All fumigations at this port are with the use of Zyklon-B

under the supervision of the medical officer of the Public Health Service; 18 such fumigations were accomplished during the year.

An antilarval campaign is being effectively carried out; and daily house-by-house inspection, together with the oiling of pools, swamps, etc., has reduced the number of deaths from malaria to 105, as compared with 231 during the preceding year. The campaign against plague has not been so extensively carried out as in previous years, owing to an order curtailing expenditures, and during the year 22,741 rodents were caught, no infection being found among them.

VERA CRUZ, MEXICO

Acting Asst. Surg. H. E. Gimler in charge. Post-office and telegraphic address, care American Consulate, Vera Cruz, Mexico.

No cases of yellow fever, human plague, or rodent plague were reported during the year. One case of typhus fever was reported in April; the source of infection was Mexico City. Anti-plague work during this period resulted in the trapping and examining of 19,769 rodents; none was found infected. Anti-mosquito work resulted in the finding of 46,017 mosquito-breeding places. The examination of the larvae showed a great number of *Anopheles* but only eight *Aedes argenteus*.

During the year, 298 vessels, carrying 21,998 crew and 7,348 passengers, were cleared from Vera Cruz for United States ports. Fumigation by the service was carried out with hydrocyanic acid gas on 10 vessels. Cyanide fumigations by the Mexican health department on 18 vessels were inspected.

Vessels visiting this port are mostly combination freight and passenger steamers, bringing in general cargo and taking out bananas, coffee, broom root, minerals, hides, and other Mexican products. The passengers are mostly salesmen and tourists.

SERVICE OPERATIONS IN EUROPE

Medical Director John McMullen in charge. Post-office and telegraphic address, American Embassy, 5 Rue de Chaillot, Paris, France.

The office in Paris is the supervisory headquarters of the operations of the Public Health Service in Europe, which embraces quarantine and immigration activities and includes also miscellaneous medical services at the various consulates, to which officers are attached as medical advisers. In addition, this office is in close contact with the International Office of Public Hygiene, facilitating the exchange of sanitary information and simplifying cooperative activities of the service.

Owing to improved health conditions in Europe, the quarantine regulations were modified for the control of typhus fever and the geographical line dividing quarantinable from nonquarantinable areas was abolished. The new regulation is based upon the epidemiology of typhus. Passengers from countries where typhus is only endemic are not detained, if they are found to be clean; but those from countries in which this disease is epidemic are required to complete 12 days from the date of departure from the infected area to date of arrival at a United States port. All infested persons must be deloused before embarkation.

There has been no ship-side inspection by a service officer at Galway, Irish Free State, during the present year, for the reason that this appeared unnecessary in view of the small amount of typhus in Ireland. However, the officer stationed at Dublin has visited Galway occasionally to inspect the methods of handling passengers at that port by the steamship company. There is at Galway a modern, well-equipped plant for disinfection and disinfestation of such passengers requiring treatment, and the work is apparently performed in a satisfactory manner. Also, in view of the diminution of travel

and the improved health conditions at Patras, Greece, it was deemed unnecessary to continue longer a medical officer of this service on duty at that port, and this work was discontinued effective April 30, 1931. For the same reason it is believed unnecessary to continue the quarantine inspection at Londonderry, and this work will probably be discontinued at that place early in the next fiscal year. On the other hand travel has materially increased at Gdynia, Poland, and the local authorities are building a large plant for the disinfection and housing of immigrants. Passengers sail direct to the United States from this port and also via British and French ports.

During the year, 181,174 passengers and 20,267 members of crew were inspected for quarantine purposes at European ports of embarkation. This number included all persons who embarked by direct lines to the United States from ports where medical officers were stationed, as well as those who were transshipped to such lines from some other port. Of the above numbers, 41,737 passengers and 1,000 members of crew were vaccinated against smallpox, and 38,639 passengers and 154 members of crew were deloused for the purpose of preventing the occurrence of typhus fever.

Typhus fever has prevailed in endemic form in several countries during the year, as follows: Poland, 1,818 cases with 119 deaths; Rumania, 1,391 cases with 127 deaths; Lithuania, 445 cases with 21 deaths; Morocco, 284 cases and 9 deaths; Egypt, 242 cases with 31 deaths; Turkey, 202 cases with 24 deaths; Algeria, 183 cases; Bulgaria, 144 cases with 16 deaths; Greece, 105 cases with 10 deaths. This disease appeared to a limited extent in Yugoslavia, with the occurrence of only 85 cases; Portugal, 52 cases; Irish Free State, 34 cases; Lettonia, 23 cases; Spain, 12 cases; Scotland, 8 cases; and Austria, 2 cases. A mild epidemic of typhus fever occurred during January and February, 1931, in Czechoslovakia, with a total of 104 cases and 5 deaths.

Smallpox of a mild type prevailed in Great Britain throughout the year, 7,446 cases with 12 deaths, showing a decrease of 41 per cent compared with the number reported during the preceding year. Smallpox appeared in Portugal, 1,180 cases with 45 deaths being reported; Turkey, 423 cases with 36 deaths; Spain, 383 cases of variola minor with 2 deaths and 110 cases of variola major with 5 deaths; Morocco, 170 cases; Tunisia, 34 deaths; Scotland, 26 cases and 2 deaths; Poland, 15 cases and 3 deaths. Some cases of smallpox have been reported in Algeria, Greece, Rumania, Russia, and Egypt.

There were a small number of cases of plague reported in Europe during the year. One case occurred in Paris on July 15, 1930, and 13 cases at Marseilles among dockers and contacts from August to November, 1930; 14 cases and 10 deaths were reported in Russia, and 2 cases in Greece. In countries surrounding Europe, Egypt heads the list with 966 cases and 182 deaths; Algeria follows with 95 cases and 14 deaths; then Morocco with 88 cases and 16 deaths and, fourth, Tunisia with 71 cases and 15 deaths.

No case of cholera has been reported in Europe during the fiscal year.

The accompanying four tables summarize the quarantine activities of the various European ports where officers are stationed.

TABLE 7.—Primary treatment of passengers and crew prior to embarkation, from July 1, 1930, to June 30, 1931

Port	Passengers inspected	Crew inspected	Passengers vaccinated	Crew vaccinated	Passengers deloused	Crew deloused	Passengers detained	Passengers rejected
Antwerp.....	5,231	0	0	0	357	0	357	0
Belfast.....	3,000	0	0	0	400	0	0	2
Bergen ¹	279	0	0	0	0	0	0	0
Bremen.....	14,616	0	0	0	2,796	0	119	108
Cobh.....	11,057	0	0	0	2,983	0	0	0
Copenhagen.....	940	0	0	0	0	0	0	0
Danzig.....	10,817	388	0	0	9,688	23	0	0
Genoa ²	2,929	0	1,204	0	108	0	0	0
Glasgow.....	5,578	0	0	0	0	0	0	0
Goteborg.....	5,690	0	0	0	181	0	146	0
Hamburg.....	22,159	0	0	0	1,441	0	267	3
Liverpool.....	13,617	0	101	0	331	0	7	0
London.....	1,124	0	0	0	0	0	0	0
Londonderry.....	2,808	0	0	0	936	0	0	0
Naples.....	35,220	11,968	35,220	0	9,280	0	0	0
Oslo.....	4,960	0	0	0	0	0	0	0
Palermo.....	1,017	0	879	0	143	0	0	2
Patras ³	2,926	4,967	1,275	118	480	131	0	8
Piraeus.....	3,002	2,944	2,845	882	2,612	0	167	0
Rotterdam.....	4,536	0	0	0	294	0	298	0
Southampton.....	22,739	0	0	0	4	0	3	0
Total.....	174,245	20,267	41,533	1,000	32,034	154	1,364	123

¹ Began Dec. 8, 1930.² Began Oct. 1, 1930.³ Discontinued Feb. 28, 1931.

TABLE 8.—Treatment of passengers coming from other points for embarkation (transmigrants) from July 1, 1930, to June 30, 1931

Treatment	Antwerp	Copenhagen	Goteborg	Rotterdam	Southampton	Total
Passengers inspected.....	59	1,141	176	277	1,632	3,285
Passengers vaccinated.....	0	0	0	0	0	0
Passengers deloused.....	59	0	146	0	210	415
Passengers detained.....	0	0	146	0	0	146
Passengers rejected.....	0	0	0	0	0	0
Baggage disinfected and passed.....	46	0	245	0	52	343
Baggage inspected and passed.....	17	0	0	0	96	113

TABLE 9.—Primary treatment of passengers proceeding to another port for embarkation from July 1, 1930, to June 30, 1931

Treatment	Class	Antwerp	Danzig	Hamburg	Piraeus	Total
Total transmigrants.....	Second.....	0	310	3	44	357
	Third.....	59	6,309	67	137	6,572
Passengers vaccinated.....	Second.....	0	0	2	32	34
	Third.....	0	0	34	136	170
Passengers deloused and passed.....	Second.....	0	162	0	13	175
	Third.....	59	6,179	56	136	6,430
Passengers inspected and passed without delousing.....	Second.....	0	148	1	31	180
	Third.....	0	130	11	1	142
Baggage disinfected and passed.....	Second.....	0	206	0	0	206
	Third.....	46	5,610	69	1,817	7,542
Baggage inspected and passed.....	Second.....	0	0	0	0	0
	Third.....	17	0	146	843	1,005
COUNTRIES OF DEPARTURE						
Albania.....					2	2
Cyprus.....					1	1
Danzig.....			14			14
Estonia.....			5			5
Germany.....				11		11
Greece.....					169	169
Hungary.....				2		2
Italy.....					7	7
Latvia.....			32			32
Lithuania.....			279	23		302
Poland.....		59	6,244	4		6,307
Rumania.....				26		26
Russia.....				45		47
Persia.....				2		2
Turkey.....					1	1
Egypt.....					1	1

TABLE 10.—Treatment of baggage, vessels, and service beneficiaries from July 1, 1930, to June 30, 1931

Port	Baggage disinfected and passed	Baggage inspected and passed	Vessels inspected	Vessels fumigated	Bills of health countersigned	Medical examination of service beneficiaries
Antwerp.....	198	196	74	38	861	19
Belfast.....	117	501	0	0	111	8
Bergen ¹	0	0	0	0	20	4
Bremen.....	2,930	970	0	93	486	10
Cobh.....	1,087	4,636	0	0	149	6
Copenhagen.....	0	0	0	0	215	17
Danzig.....	8,918	0	108	0	20	0
Genoa ²	0	524	30	30	332	5
Glasgow.....	0	0	0	0	346	1
Goteborg.....	245	0	20	0	76	5
Hamburg.....	2,753	36,276	2	232	903	1
Liverpool.....	0	0	0	0	540	8
London.....	0	0	0	0	598	19
Londonderry.....	74	74	33	0	0	0
Naples.....	35,549	28,434	136	1	265	94
Oslo.....	0	0	0	0	109	0
Palermo.....	543	992	0	0	100	0
Patras ³	2,368	2,581	22	0	22	26
Piraeus.....	1,817	842	30	0	70	14
Rotterdam.....	420	1,261	38	69	563	2
Southampton.....	2	2	0	0	490	5
Stockholm.....	0	0	0	0	99	4
Total.....	57,015	77,289	493	463	6,375	286

¹ Began Dec. 8, 1930.² Began Oct. 1, 1930.³ Discontinued Feb. 28, 1931

SUMMARY OF QUARANTINE TRANSACTIONS AT CONTINENTAL, INSULAR, AND FOREIGN STATIONS

TABLE 11.—Summary of quarantine transactions at continental, insular, and foreign stations for the fiscal year ended June 30, 1931

Station	Vessels inspected	Vessels fumigated	Passengers inspected	Crew inspected	Bills of health and port sanitary statements issued
Continental.....	14,955	2,942	1,773,743	1,039,524	41,385
Insular.....	3,417	540	161,037	235,537	7,604
Foreign.....	4,132	590	365,194	316,711	11,034
Total.....	22,504	4,072	1,299,974	1,591,772	60,023

¹ Maritime stations, 671,773; border stations, 101,970. Statistics do not include "local" travelers at border stations, numbering 10,304,042, who, however, were under surveillance.

MEDICAL INSPECTION OF ALIENS

During the fiscal year there were examined by medical officers of the United States Public Health Service 761,436 alien passengers for the purpose of detecting physical or mental defects or diseases, as provided by the United States immigration laws. In addition, 916,868 alien seamen were inspected during the fiscal year ended June 30, 1931, as provided for in the act of February 5, 1917.

During the past year the Regulations Governing the Medical Examination of Aliens were revised and made available for distribution. The previous regulations were promulgated in 1917, and therefore revision was required to accord with advances made in the detection of diseases, etc., as a result of research along these lines.

EXAMINATION OF PROSPECTIVE IMMIGRANTS ABROAD

There has been no material change during the past year in the system of making medical examinations of applicants for immigration visas in their countries in Europe. On July 1, 1930, an office was opened in the American Consulate General at Vienna, Austria, where applicants were examined according to the intensive method before visas were granted.

The system of the medical examination of applicants for visas at consulates which was inaugurated in the Western Hemisphere at Montreal, Canada, during the fiscal year 1929 was extended during the past year to Hamilton, Ottawa, Quebec, Toronto, Vancouver, Windsor, Winnipeg, Yarmouth; Habana, Cuba; and Mexico City, Mexico. At several of the Canadian stations medical officers of the Public Health Service are performing the medical examination of intending immigrants for both the local office of the Immigration Service of the United States Department of Labor and for the Department of State.

There were 103,078 applicants for immigration visas examined by medical officers in foreign countries. Of this number, 79,058 were examined by medical officers of the service attached to American consulates in Europe, and 1,622 were reported by these officers to the consular officers as afflicted with one or more of the diseases listed in class A as mandatorily excludable; 13,458 were reported as afflicted with a disease or condition listed in class B as liable to affect their ability to earn a living. Of the 24,020 aliens examined by medical officers of the Public Health Service in their countries of origin in the Western Hemisphere, 180 were reported to consular officers as afflicted with one or more of the diseases listed under class A as mandatorily excludable, and 2,287 were reported as afflicted with a disease or condition listed in class B as liable to affect their ability to earn a living.

Of 94,412 aliens who had been given a preliminary medical examination in foreign countries and to whom visas had been issued, only 11 were certified upon arrival at a United States port as being afflicted with class A diseases, resulting in mandatory deportation.

TABLE 12.—Alien passengers inspected and certified at maritime ports in the United States and its dependencies

Place	Number of alien passengers examined	Alien passengers certified				Total	Important diseases for which class A certification was made											
		Class A		Class B	Class C		Idiocy, imbecility, feeble-minded	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Other dangerous or loathsome contagious diseases
		(1) Idiocy, imbecility, feeble-minded, insanity, epilepsy, chronic alcoholism	(2) Tuberculosis or other loathsome or dangerous contagious diseases	Diseases or defects which affect ability to earn a living	Disease or defects of less degree													
<i>Atlantic coast</i>																		
Baltimore, Md.	129		5			5									2	3		
Beaufort, S. C.	0					0												
Boston, Mass.	6,140	2	2	244	23	271		2			1					1		
Brunswick, Ga.	0					0												
Charleston, S. C.	185					0												
Fall River, Mass.	1					0												
Fernandina, Fla.	0					0												
Fort Everglades, Fla.	0					0												
Fort Monroe, Va. ¹	167					0												
Fort Pierce, Fla.	0					0												
Georgetown, S. C.	0					0												
Gloucester, Mass.	0					0												
Jacksonville, Fla.	120		1			1				1								
Key West, Fla.	5,825			16		16												
Lewes, Del.	0					0												
Miami, Fla.	3,225			2	6	8												
New Bedford, Mass.	62					0												
New London, Conn.	0					0												
Newport, R. I.	0					0												
New York, N. Y. (Ellis Island)	205,712	19	56	8,979		9,500	6	1	5	7	8	20		2	2	24		
Perth Amboy, N. J.	2					0												
Philadelphia, Pa.	521					0												
Plymouth, Mass.	91					0												
Portland, Me.	0					0												
Providence, R. I.	2,051			69	4	73												
Savannah, Ga.	116					0												
Searsport, Me.	0					0												
Vineyard Haven, Mass.	0					0												

¹ Embraces Newport News, Va., and Norfolk, Va.

TABLE 12.—*Alien passengers inspected and certified at maritime ports in the United States and its dependencies—Continued.*

Place	Number of alien passengers examined	Alien passengers certified				Total	Important diseases for which class A certification was made											
		Class A		Class B	Class C		Idiocy, imbecility, feeble-minded	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Other dangerous or loathsome contagious diseases
		(1) Idiocy, imbecility, feeble-minded, insanity, epilepsy, chronic alcoholism	(2) Tuberculosis or other loathsome or dangerous contagious diseases	Diseases or defects which affect ability to earn a living	Disease or defects of less degree													
<i>Atlantic coast—Continued.</i>																		
Washington, N. C.....	0					0												
West Palm Beach, Fla.....	31					0												
Wilmington, N. C.....	116					0												
Total.....	224,494	21	64	9,310	479	9,874	6	1	7	7	0	9	21	0	2	4	28	
<i>Gulf coast</i>																		
Boca Grande, Fla.....	0					0												
Carrabelle, Fla.....	0					0												
Cedar Keys, Fla.....	0					0												
Corpus Christi, Tex.....	28					0												
Freeport, Tex.....	0					0												
Galveston, Tex.....	198					0												
Gulfport, Ala.....	0					0												
Mobile, Ala.....	54					0												
Morgan City, La. (Atchafalaya).....	0					0												
New Orleans, La.....	3,662		4	10	12	26						4						
Panama City, Fla.....	0					0												
Pascagoula, Miss.....	0					0												
Pensacola, Fla.....	0					0												
Port Aransas, Tex.....	1					0												
Sabine, Tex.....	0					0												
Tampa, Fla.....	27					0												
Port St. Joe, Fla.....	113					0												
	0					0												
Total.....	4,083	0	4	10	12	26	0	0	0	0	0	0	4	0	0	0	0	

<i>Pacific coast</i>																		
Aberdeen, Wash.....	0					0												
Angel Island, Calif. (San Francisco).....	8,089		20	200	172	392						6	6		2		4	2
Astoria, Oreg.....	2					0												
Eureka, Calif.....	0					0												
Fort Bragg, Calif.....	0					0												
Marshfield, Oreg. (Coos Bay).....	0					0												
Monterey, Calif.....	0					0												
Newport, Oreg.....	0					0												
Portland, Ore.....	4	1	1	2		4	1					1						
San Diego, Calif.....	983	2	3			5		1				1			2			
San Luis Obispo, Calif.....	0					0												
San Pedro, Calif.....	7,463	1	3	22	8	34			1			1	1				1	
Santa Barbara, Calif.....	0					0												
Seattle, Wash. ¹	4,585	9	19	49	62	139		2	2	5		2			7	1	8	1
South Bend, Wash.....	0					0												
Total.....	21,126	13	46	273	242	574	2	2	4	5	0	11	7	0	11	2	12	3
<i>Insular</i>																		
Alaska: Ketchikan.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii: Honolulu.....	4,099		12	124	44	180	0	0	0	0	0	2	1	0	1	1	6	1
Philippines:																		
Cebu.....	0					0												
Davao.....	12					0												
Iloilo.....	0					0												
Jolo.....	83					0												
Legaspi.....	0					0												
Manila.....	23,686		67	68		135							2	65				
Zamboanga.....	205		1	1		2									1			
Total.....	23,986	0	68	69	0	137	0	0	0	0	0	0	2	65	1	0	0	0
Porto Rico:																		
Aguadilla.....	2					0												
Arecibo.....	0					0												
Arroyo.....	0					0												
Central Aguirre (Jobos).....	0					0												
Fajardo.....	24					0												
Guanica.....	10					0												
Humacao.....	0					0												
Mayaguez.....	1					0												
Ponce.....	23					0												
San Juan.....	7,772	1		4	1	6				1								
Total.....	7,832	1	0	4	1	6				1								
Total, all stations.....	285,620	35	194	9,790	778	10,797	8	3	11	13	0	22	35	65	15	7	46	4

¹ Embraces all ports on Puget Sound.

TABLE 13.—Alien passengers inspected and certified at international border stations

Place	Number persons making permanent entry examined	Number persons making temporary entry examined	Alien passengers certified				Total	Important diseases for which class A certifications were made											
			Class A		Class B	Class C		Idiocy, imbecility, feeble-minded	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Other dangerous or loathsome contagious diseases
			(1) Idiocy, imbecility, feeble-minded, insanity, epilepsy, chronic alcoholism	(2) Tuberculosis or other loathsome or dangerous contagious diseases	Diseases or defects which affect ability to earn a living	Diseases or defects of less degree													
<i>Mexican border</i>																			
Ajo, Ariz.....	0	242		1			1										1	28	2
Brownsville, Tex.....	1,977	11,678	4	40	296	132	472			4		5	3		1	1	3	7	6
Calexico, Calif.....	364	9,435	10	108	4	33	155	2			2	1	97			3			
Columbus, N. Mex.....		719					0												
Del Rio, Tex.....	45	4,792	2	3	8	5	18	2						1				2	
Douglas, Ariz.....	1,843	3,276	4	37	16	84	141	1	1	4			35		1			1	
Eagle Pass, Tex.....	403	4,348	4	2	25	13	44	1	1	1								1	2
El Paso, Tex.....	1,951	12,120	52	248	855	381	1,536	9	12	14	14	3	40	3	2	143	1	59	
Guadalupe Gate, Tex.....	0	498		2		13	15									2			
Hidalgo, Tex.....	424	3,600	2	80	200	39	321			2		1	67	5	1	1	1	2	3
Laredo, Tex.....	20,712	16,933	8	79	275	12	374	5	2	1		2	7	20	1	12	36	1	
Naco, Ariz.....	17	3,784	15	29	45	130	219	1	1	9		4	3	10	11	1	4		
Nogales, Ariz.....	5,030	17,368	13	52	237	256	558	7	1	2	2	1	2	12	2	5	2	29	
Presidio, Tex.....	11	6,625	1	4	4	88	97			1								1	3
Rio Grande, Tex.....	5	907	1	11	4	4	20			1				9	1			1	
Roma, Tex.....	4	852		5	27	37	69											1	3
San Ysidro, Calif.....	513	11,177	10	65	346	16	437	3		7		5	1	2	27	1	27	2	
Sasabe, Ariz.....	6	425	1	1		2	4			1					1				
Thayer, Tex.....	8	850		6	6	2	14							2		1		3	
Tucson, Ariz.....		509	19	137	33	5	194	3	4	1	11		12	40		52	1	25	7
Ysleta, Tex.....		118				3	3												
Zapata, Tex.....	152	514		1	5	2	8										1		
Total.....	33,465	110,770	146	911	2,386	1,257	4,700	33	20	20	56	10	72	286	34	246	25	226	29

TABLE 14.—Alien seamen inspected and certified at all ports in the United States and possessions

Place	Number of alien seamen examined	Alien seamen certified				Total	Important diseases for which class A certification was made											
		Class A		Class B	Class C		Idiocy, imbecility, feeble-minded	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Other dangerous or loathsome contagious diseases
		(1) Idiocy, imbecility, feeble-minded, insanity, epilepsy, chronic alcoholism	(2) Tuberculosis or other loathsome or dangerous contagious diseases	Diseases or defects which affect ability to earn a living	Diseases or defects of less degree													
<i>Atlantic coast</i>																		
Baltimore, Md.	17,923	2	66	22	2	92	1				2	1			13	13	37	
Beaufort, S. C.	0					0												
Boston, Mass.	54,655	1	74	219	10	304		1			3	6		10	32	23		
Brunswick, Ga.	235					0												
Charleston, S. C.	3,336		7			7									5	2		
Fall River, Mass.	1,221					0												
Fernandina, Fla.	0					0												
Fort Everglades, Fla.	0					0												
Fort Monroe, Va. ¹	13,838	1	31	3	9	44			1		2			1	3	25		
Fort Pierce, Fla.	0					0												
Georgetown, S. C.	0					0												
Gloucester, Mass.	162		1	1	2	4									1			
Jacksonville, Fla.	2,578		5			5				1				2	1	1		
Key West, Fla.	2,526					0												
Lewes, Del.	18					0												
Miami, Fla.	10,628	1	1	1		3									1	1		
New Bedford, Mass.	0					0												
New London, Conn.	117		3		6	9								1		1		
Newport, R. I.	0					0												
New York, N. Y. (Ellis Island)	546,374	4	296	19	8	327		1	1	2	5	8		53	86	144		
Perth Amboy, N. J.	3,250			3		3												
Philadelphia, Pa.	25,279	1	50	1		52					1			17	5	27		
Plymouth, Mass.	0					0												
Portland, Me.	3,684		7			7												
Providence, R. I.	5,344					0					2			4		1		
Searsport, Me.	0					0												
Savannah, Ga.	2,706		5		5	10									2	3		

Vineyard Haven, Mass.....	0					0													
Washington, N. C.....	0					0													
West Palm Beach, Fla.....	134					0													
Wilmington, N. C.....	1,418					0													
Total	695,426	10	546	269	42	867	1	1	4	3	0	16	15	0	101	149	265	1	
<i>Gulf coast</i>																			
Boca Grande, Fla.....	204					0													
Carrabella, Fla. (St. George Sound).....	0					0													
Cedar Keys, Fla.....	0					0													
Corpus Christi, Tex.....	844					0													
Freeport, Tex.....	0					0													
Galveston, Tex.....	23,367		45			45										1		44	
Gulfport, Miss.....	0					0													
Mobile, Ala.....	4,897					0													
Morgan City, La. (Atchafalaya).....	0					0													
New Orleans, La.....	37,153	7	128	35	146	316	2		4	1		6	1	1	46	7	57	10	
Panama City, Fla.....	76					0													
Pascagoula, Miss.....	0					0													
Pensacola, Fla.....	1,204		1	1	2	4									1				
Port Aransas, Tex.....	0					0													
Port St. Joe, Fla.....	4,929		9			9											7		2
Sabine Pass, Tex.....	2,791			10		10													
Tampa, Fla.....	0					0													
Total	75,465	7	183	46	148	384	2	0	4	1	0	6	1	1	47	15	103	10	
<i>Pacific coast</i>																			
Aberdeen, Wash.....	512					0													
Astoria, Oreg.....	2,705					0													
Angel Island, Calif. (San Francisco).....	61		6	1	2	9						1					3	2	
Eureka, Calif.....	0					0													
Fort Bragg, Calif.....	0					0													
Marshfield, Oreg. (Coos Bay).....	385					0													
Monterey, Calif.....	0					0													
Newport, Oreg.....	0					0													
Portland, Oreg.....	688		8	2		10							1		5			2	
San Diego, Calif. (Point Loma).....	6,765					0													
San Luis Obispo, Calif.....	380					0													
San Pedro, Calif.....	50,381	1	60	13	11	85			1			1	4	1	15	4	33	2	
Santa Barbara, Calif.....	0					0													
Seattle, Wash. ¹	9,485	1	3	1	1	6			1							2	1		
South Bend, Wash.....	0					0													
Total	71,362	2	77	17	14	110	0	0	1	1	0	2	5	1	22	8	37	2	

¹ Embraces Newport News, Va., and Norfolk, Va.

² Embraces all ports on Puget Sound.

TABLE 14.—*Alien seamen inspected and certified at all ports in the United States and possessions—Continued.*

Place	Number of alien seamen examined	Alien seamen certified				Total	Important diseases for which class A certification was made											
		Class A		Class B	Class C		Idiocy, imbecility, feeble-minded	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Other dangerous or loathsome contagious diseases
		(1) Idiocy, imbecility, feeble-minded, insanity, epilepsy, chronic alcoholism	(2) Tuberculosis or other loathsome or dangerous contagious diseases	Diseases or defects which affect ability to earn a living	Diseases or defects of less degree													
<i>Canadian border</i>																		
Blaine, Wash.	0					0												
Bellingham, Wash.	209					0												
Buffalo, N. Y.	20,672	2		170		172	1	1										
Calais, Me.	0					0												
Detroit, Mich.	0					0												
Duluth, Minn.	319			1	1	2												
Eastport, Me.	1,388					0												
Erie, Pa.	546					0												
Lewiston, N. Y.	133					0												
Ogdensburg, N. Y.	208			1		1												
Port Huron, Mich.	0					0												
Sault Ste. Marie, Mich.	0					0												
Total	23,475	2		172	1	175	1	1	0	0	0	0	0	0	0	0	0	
<i>Insular</i>																		
Alaska: Ketchikan	0	0	0	0	0	0												
Hawaii: Honolulu	28,130	0	41	3	0	44					1			5	2	33	0	
<i>Philippine Islands:</i>																		
Cebu	0					0												
Davao	0					0												
Iloilo	0					0												
Jolo	0					0												
Legaspi	0					0												
Manila	1,425					0												
Zamboanga	0					0												
Total	1,425	0	0	0	0	0												

Porto Rico;																				
Aguadilla.....	129					0														
Arecibo.....	0					0														
Arroyo.....	7					0														
Central Aguirre.....	7		1			1												1		
Fajardo.....	128					0														
Guanica.....	521		1			1													1	
Humacao.....	136					0														
Mayaguez.....	152					0														
Ponce.....	1,231		4			4						1						1	2	
San Juan.....	19,274		11			11									3			3	5	
Total.....	21,585	0	17	0	0	17	0	0	0	0	0	1	0	0	3			4	9	0
Total, all stations.....	916,868	21	864	507	205	1,597	4	2	9	5	0	26	21	2	178	178	447		13	

TABLE 15.—Summary of medical inspection of aliens

MARITIME STATIONS

GROUP I.—ALIEN PASSENGERS NOT EXAMINED ABROAD, EXAMINED UPON ARRIVAL

Class	Total examined	Intensively examined	Passed	Certified on arrival				Total certified
				A-I	A-II	B	C	
First.....	70,898	698	70,559	8	31	221	79	339
Second.....	50,235	1,792	49,632	8	12	488	95	603
Third.....	119,113	9,554	116,526	13	128	1,864	582	2,587
Stowaways.....	650	516	606	1	21	14	8	44
Total.....	240,896	12,560	237,323	30	192	2,587	764	3,573

GROUP II.—ALIEN PASSENGERS EXAMINED ABROAD, REEXAMINED ON ARRIVAL

Class	Total examined	Intensively examined	Passed abroad	Passed on arrival	Certified on arrival (condition noted abroad)			Certified on arrival (condition not noted abroad)			Total certified		
					B	C	Number certified	A-I	A-II	B		C	Number certified
					First.....	2,241	29	2,057	2,048	184		---	184
Second.....	10,927	87	9,124	9,122	1,801	2	1,803	1	---	---	1	2	1,805
Third.....	31,556	590	26,349	26,330	5,197	10	5,207	4	2	12	1	19	5,226
Total.....	44,724	706	37,530	37,500	7,182	12	7,194	5	2	21	2	30	7,224

GROUP III.—ALIEN SEAMEN, EXAMINED ON ARRIVAL

	Total examined	Intensively examined	Passed	Certified				Total certified
				A-I	A-II	B	C	
Alien crew.....	893,235	319,595	891,820	19	864	331	202	1,416
Workaways.....	158	75	152	0	0	4	2	6
Total.....	893,393	319,670	891,972	19	864	335	204	1,422

TABLE 16.—Summary of medical inspection of aliens

CANADIAN AND MEXICAN BORDER STATIONS

GROUP I.—ALIEN PASSENGERS NOT EXAMINED ABROAD, EXAMINED UPON ARRIVAL

Class	Total examined	Intensively examined	Passed	Certified on arrival				Total certified
				A-I	A-II	B	C	
Statistical, making permanent entry (bona fide immigrants).....	51,022	29,979	48,000	196	234	1,687	905	3,022
Statistical, making temporary entry.....	27,421	9,042	25,832	56	142	1,025	366	1,589
Nonstatistical, making entry (local crossers, etc.).....	392,351	55,903	387,960	131	727	2,322	1,211	4,391
Total.....	470,794	104,924	461,792	383	1,103	5,034	2,482	9,002

TABLE 16.—*Summary of medical inspection of aliens—Continued.*

GROUP II.—ALIEN PASSENGERS EXAMINED ABROAD, REEXAMINED ON ARRIVAL

Class	Total examined	Intensively examined	Passed abroad	Passed on arrival	Certified on arrival (condition noted abroad)			Certified on arrival (condition not noted abroad)				Total certified	
					B	C	Number certified	A-I	A-II	B	C		Number certified
Statistical, making permanent entry (bona fide immigrants).....	2,368	2,361	2,248	2,240	119	1	120	-----	-----	3	5	8	128
Statistical, making temporary entry.....	2,608	2,608	2,608	2,591	-----	-----	-----	2	-----	15	-----	17	17
Nonstatistical, making entry (local crossers, etc.).....	46	46	46	28	-----	-----	-----	2	-----	-----	16	18	18
Total.....	5,022	5,017	4,902	4,859	119	1	120	4	-----	18	21	43	163

GROUP III.—ALIEN SEAMEN, EXAMINED ON ARRIVAL

	Total examined	Intensively examined	Passed	Certified				Total certified
				A-I	A-II	B	C	
Alien crew.....	23,475	22,020	23,300	2	0	172	1	175
Workaways.....	0	0	0	0	0	0	0	0
Total.....	23,475	22,020	23,300	2	0	172	1	175

IMMIGRATION ON THE EASTERN HEMISPHERE

EUROPEAN PORTS

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The medical examination of applicants for immigration visas at the several consulates in Europe has continued along the same lines as in previous years. A series of intelligence tests was given during the year by, or under the direction of, Surg. Lawrence Kolb to 1,200 aliens applying for visas at Dublin, Cobh, Cologne, Stuttgart, Oslo, Stockholm, Goteborg, Naples, and Southampton. This was a continuation of mental studies previously started, and about 2,500 applicants have now been examined in order to determine the effect of race and environment on intelligence test ability and to establish more nearly exact methods for evaluating mental capacity in the routine examination of immigrants.

Regular applicants for visas continually decreased during the fiscal year; however, at the request of the State Department, aliens who had previously made application for visa and were on the "waiting list" were requested to apply at the consulate for examination on specified dates. As a result of this order the work of the medical officers attached to consulates was materially increased during this period and it became necessary temporarily to increase the number of medical personnel from 32 to 35 medical officers. The

total number of aliens examined during the year was 79,058, as compared with 156,370 during the preceding year, a decrease of 77,312, or 49.4 per cent. The economic depression in the United States and the issuance of an Executive order in September, 1930, for a temporary restrictive immigration are responsible for the decrease in the number of aliens applying for visas.

While the total number of aliens examined was considerably less than in the preceding year, the percentages of notifications for classes A and B conditions were notably in excess of last year. Of the 1,622 class A certificates issued, about one-third were for mental conditions. Of the aliens certified for class B conditions, 43.4 per cent were refused visas by consular officers.

On July 1, 1930, a medical officer was assigned to duty at the American consulate at Vienna, Austria, for the purpose of examining applicants before visas were granted. During the year the medical examination of applicants for immigration visas at the ports of Bergen and Oslo was conducted by one medical officer, who traveled between the two points. This is true also for Goteborg and Stockholm.

TABLE 17.—*Distribution according to class of applicants for immigration visas who were medically examined at each station from July 1, 1930, to June 30, 1931*

Country and consular office	Total applicants examined	Number of applicants in each class			Per cent of applicants in each class		
		Quota	Non-quota	Non-immigrants	Quota	Non-quota	Non-immigrants
Belgium: Antwerp.....	609	415	194	0	68.1	31.9	0
England, total.....	7,031	5,777	1,254	0	82.1	17.9	0
Liverpool.....	2,491	2,156	335	0	86.5	13.5	0
London.....	3,464	2,729	735	0	78.7	21.3	0
Southampton.....	1,076	892	84	0	82.9	17.1	0
Irish Free State, total.....	7,089	6,647	438	4	93.7	6.1	.1
Cobh.....	2,760	2,602	158	0	94.3	5.7	0
Dublin.....	4,329	4,045	280	4	93.4	6.5	.1
Northern Ireland: Belfast.....	1,234	1,117	117	0	90.5	9.5	0
Scotland: Glasgow.....	3,928	3,295	632	1	83.9	16.0	.1
Germany, total.....	16,452	14,845	1,586	1	90.3	9.6	.1
Berlin.....	4,129	3,637	492	0	88.1	11.9	0
Bremen.....	1,475	1,310	165	0	88.8	11.2	0
Cologne.....	3,738	3,439	299	0	92.0	8.0	0
Hamburg.....	1,234	941	292	1	76.3	23.6	.1
Stuttgart.....	5,856	5,518	338	0	94.3	5.7	0
Holland: Rotterdam.....	1,747	1,578	162	7	90.1	9.5	.4
Poland: Warsaw.....	10,148	8,223	1,925	0	81.0	19.0	0
Denmark: Copenhagen.....	1,477	1,236	241	0	83.6	16.4	0
Norway, total.....	3,737	3,376	361	0	90.4	9.6	0
Bergen.....	1,097	967	130	0	88.2	11.8	0
Oslo.....	2,640	2,409	231	0	91.2	8.8	0
Sweden, total.....	2,326	1,997	329	0	85.7	14.3	0
Goteborg.....	1,231	1,044	187	0	84.8	15.2	0
Stockholm.....	1,095	953	142	0	87.0	13.0	0

TABLE 17.—*Distribution according to class of applicants for immigrants visas who were medically examined at each station from July 1, 1930, to June 30, 1931—Continued.*

Country and consular office	Total applicants examined	Number of applicants in each class			Per cent of applicants in each class		
		Quota	Non-quota	Non immigrants	Quota	Non-quota	Non immigrants
Italy, total.....	17, 178	5, 653	11, 525	0	31. 8	68. 2	0
Genoa.....	2, 712	1, 094	1, 618	0	40. 3	59. 7	0
Naples.....	10, 518		7, 393	0	29. 4	70. 6	0
Palermo.....	3, 948	1, 434	2, 514	0	36. 3	63. 7	0
Czechoslovakia: Prague.....	2, 810	1, 840	968	2	65. 4	34. 5	. 1
Austria: Vienna.....	1, 081	811	270	0	75. 0	25. 0	0
All countries.....	76, 827	56, 810	20, 002	15	73. 9	26. 0	. 1

Preliminary or informal examinations at Cologne, Berlin, and Vienna (not included in above), 2,231, making the total number of applicants examined 79,058.

TABLE 18.—*Distribution according to sex of applicants for immigration visas who were medically examined at each station from July 1, 1930, to June 30, 1931*

Country and consular office	Number of each sex examined		Per cent of each sex examined	
	Male	Female	Male	Female
Belgium: Antwerp.....	298	311	48. 6	51. 4
England:				
Liverpool.....	1, 044	1, 447	41. 9	58. 1
London.....	1, 530	1, 934	44. 2	55. 8
Southampton.....	550	526	51. 1	48. 9
Irish Free State:				
Cobh.....	1, 014	1, 746	36. 7	63. 3
Dublin.....	1, 455	2, 874	33. 6	66. 4
Northern Ireland: Belfast.....	434	800	35. 1	64. 9
Scotland: Glasgow.....	1, 403	2, 525	35. 7	64. 3
Germany:				
Berlin.....	1, 884	2, 245	45. 6	54. 4
Bremen.....	660	815	44. 7	55. 3
Cologne.....	1, 652	2, 086	44. 2	55. 8
Hamburg.....	618	616	50. 0	50. 0
Stuttgart.....	2, 375	3, 481	40. 6	59. 4
Holland: Rotterdam.....	943	804	53. 9	46. 1
Polland: Warsaw.....	5, 641	4, 507	55. 5	44. 5
Denmark: Copenhagen.....	784	693	53. 0	47. 0
Norway:				
Bergen.....	546	551	49. 8	50. 2
Oslo.....	1, 043	1, 597	39. 5	60. 5
Sweden:				
Goteborg.....	580	651	47. 1	52. 9
Stockholm.....	495	600	45. 2	54. 8
Italy:				
Genoa.....	862	1, 850	31. 8	68. 2
Naples.....	4, 387	6, 131	41. 7	58. 3
Palermo.....	1, 481	2, 467	37. 5	62. 5
Czechoslovakia: Prague.....	1, 258	1, 552	44. 7	55. 3
Austria: Vienna.....	547	534	50. 6	49. 4
All countries.....	33, 484	43, 343	43. 5	56. 5

TABLE 19.—Number and percentage of applicants medically examined who were notified for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Number notified for—			Per cent of applicants notified for—		
	Class A	Class B	Total, A and B	Class A	Class B	Total, A and B
Belgium: Antwerp.....	1	73	74	0.1	12.0	12.1
England:						
Liverpool.....	14	513	527	.5	21.0	21.5
London.....	10	571	581	.3	16.4	16.7
Southampton.....	11	138	149	1.0	12.8	13.8
Irish Free State:						
Cobh.....	48	504	552	1.7	18.3	20.0
Dublin.....	61	674	735	1.4	15.5	16.9
Northern Ireland: Belfast.....	40	373	413	3.0	30.1	33.1
Scotland: Glasgow.....	17	373	390	.4	9.5	9.9
Germany:						
Berlin.....	68	1,132	1,200	1.6	27.4	29.0
Bremen.....	13	200	213	.8	13.5	14.3
Cologne.....	52	705	757	1.3	18.8	20.1
Hamburg.....	10	104	114	.8	8.4	9.2
Stuttgart.....	43	851	894	.7	14.5	15.2
Holland: Rotterdam.....	10	340	350	.6	19.4	20.0
Poland: Warsaw.....	181	1,687	1,868	1.7	16.6	18.3
Denmark: Copenhagen.....	2	146	148	.1	10.0	10.1
Norway:						
Bergen.....	3	237	240	.2	21.6	21.8
Oslo.....	15	738	753	.5	28.0	28.5
Sweden:						
Goteborg.....	11	178	189	.9	14.4	15.3
Stockholm.....	15	173	188	1.3	15.8	17.1
Italy:						
Genoa.....	168	577	745	6.2	21.2	27.4
Naples.....	378	1,773	2,151	4.9	23.0	27.9
Palermo.....	345	974	1,319	8.7	24.6	33.3
Czechoslovakia: Prague.....	80	319	399	2.8	11.3	14.1
Austria: Vienna.....	26	105	131	2.4	9.7	12.1
All countries.....	1,622	13,458	15,080	2.2	17.5	19.7

TABLE 20.—Percentage distribution of male and female applicants examined, notified according to class of disability from July 1, 1930, to June 30, 1931

Country and consular office	Per cent of applicants who had—		Per cent of males who had—		Per cent of females who had—	
	Class A	Class B	Class A	Class B	Class A	Class B
Belgium: Antwerp.....	0.1	12.0	0.1	13.4	0	10.5
England:						
Liverpool.....	.5	21.0	.5	21.2	.6	20.8
London.....	.3	16.4	.3	13.7	.3	18.6
Southampton.....	1.0	12.8	.9	10.7	1.1	14.8
Irish Free State:						
Cobh.....	1.7	18.3	1.4	18.1	1.8	18.2
Dublin.....	1.4	15.5	1.0	15.2	1.6	15.7
Northern Ireland: Belfast.....	3.0	30.1	1.1	26.5	4.3	32.2
Scotland: Glasgow.....	.4	9.5	.4	15.1	.3	6.3
Germany:						
Berlin.....	1.6	27.4	1.6	29.2	1.6	25.8
Bremen.....	.8	13.5	.9	13.1	.7	13.8
Cologne.....	1.3	18.8	1.1	15.0	1.4	15.9
Hamburg.....	.8	8.4	.6	8.4	.9	8.4
Stuttgart.....	.7	14.5	.6	13.6	.8	15.1
Holland: Rotterdam.....	.6	19.4	.5	20.0	.6	18.7
Poland: Warsaw.....	1.7	16.6	1.4	17.3	2.1	15.7
Denmark: Copenhagen.....	.1	10.0	.2	7.1	0	12.9
Norway:						
Bergen.....	.2	21.6	.1	21.7	.3	21.4
Oslo.....	.5	28.0	.8	26.3	.3	29.0
Sweden:						
Goteborg.....	.9	14.4	1.1	13.7	.6	16.5
Stockholm.....	1.3	15.8	1.4	13.5	1.3	17.5
Italy:						
Genoa.....	6.2	21.2	5.9	24.9	6.2	19.5
Naples.....	4.9	23.0	2.9	16.7	4.0	16.9
Palermo.....	8.7	24.6	8.7	24.5	8.8	24.6
Czechoslovakia: Prague.....	2.8	11.3	3.3	9.7	2.5	12.6
Austria: Vienna.....	2.4	9.7	2.1	8.6	2.6	10.8
All countries.....	2.2	17.5	1.8	17.2	2.3	17.4

TABLE 21.—Number and percentage of quota applicants who were notified for different classes of disabilities from July 1, 1930, to June 30, 1931

Country	Total number of quota applicants examined	Number notified			Per cent of total examined who were notified		
		Class A conditions	Class B conditions	Total, classes A and B	Class A	Class B	Total, classes A and B
Belgium	415	1	47	48	0.2	11.3	11.5
England	5,777	33	1,028	1,061	.5	17.8	18.3
Irish Free State	6,647	103	1,076	1,179	1.5	16.1	17.6
North Ireland	1,117	37	338	375	3.3	30.2	33.5
Scotland	3,295	15	331	346	.4	10.1	10.5
Germany	14,845	158	2,612	2,770	1.0	17.5	18.5
Holland	1,578	9	318	327	.5	20.1	20.6
Poland	8,223	136	1,512	1,648	1.6	18.4	20.0
Denmark	1,236	2	116	118	.1	9.3	9.4
Norway	3,376	17	862	879	.5	25.5	26.0
Sweden	1,997	23	274	297	1.1	13.7	14.8
Italy	5,653	285	2,128	2,413	5.0	37.8	42.8
Czechoslovakia	1,840	35	228	263	1.8	12.4	14.2
Austria	811	20	88	108	2.4	10.9	13.3
All countries	56,810	874	10,958	11,832	1.5	19.3	20.8

TABLE 22.—Number and percentage of nonquota applicants who were notified for different classes of disabilities from July 1, 1930, to June 30, 1931

Country	Total number of non-quota applicants examined	Number notified			Per cent of total examined who were notified		
		Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium	194	0	26	26	0	13.4	13.4
England	1,254	2	194	196	.1	15.4	15.5
Irish Free State	438	6	98	104	1.3	22.3	23.6
Northern Ireland	117	3	35	38	2.5	29.9	32.4
Scotland	632	2	41	43	.3	6.5	6.8
Germany	1,586	25	293	318	1.5	18.5	20.0
Holland	162	0	30	30	0	18.5	18.5
Poland	1,925	45	175	220	2.3	9.1	11.4
Denmark	241	0	30	30	0	12.4	12.4
Norway	361	1	113	114	.2	31.3	31.5
Sweden	329	3	77	80	.9	23.4	24.3
Italy	11,525	606	1,196	1,802	5.2	10.4	15.6
Czechoslovakia	968	44	90	134	4.5	9.3	13.8
Austria	270	6	17	23	2.2	6.3	8.5
All countries	20,002	743	2,415	3,158	3.7	12.0	15.7

TABLE 23.—Percentage distribution of total quota and nonquota applicants of each sex who were notified for different classes of disabilities from July 1, 1930, to June 30, 1931

Country	Quota						Nonquota					
	Male			Female			Male			Female		
	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B
Belgium	0.4	11.9	12.3	0	10.2	10.2	0	17.1	17.1	0	10.3	10.3
England	.5	15.8	16.3	.4	19.2	19.6	.3	13.4	13.7	0	17.4	17.4
Irish Free State	1.2	16.1	17.3	1.7	16.1	17.8	1.0	19.1	20.0	1.6	24.9	26.5
Northern Ireland	1.3	26.0	21.3	4.3	32.4	36.7	0	29.7	29.7	4.2	30.0	34.2
Scotland	.5	16.5	17.0	.4	6.6	7.0	.3	9.6	9.9	.3	3.9	4.2
Germany	.9	17.5	18.4	1.1	17.6	18.7	1.5	19.5	21.0	1.5	17.6	19.1
Holland	.5	19.9	20.4	.5	19.1	19.6	0	20.0	20.0	0	16.8	16.8
Poland	1.2	18.1	19.3	2.3	18.3	20.6	2.8	11.6	14.4	2.0	7.5	9.5
Denmark	.2	7.5	7.7	0	11.6	11.6	0	4.7	4.7	0	18.3	18.3
Norway	.6	24.3	24.9	.4	26.4	26.8	.6	29.0	29.6	0	32.6	32.6
Sweden	1.4	11.8	13.2	.9	15.3	16.2	.5	23.5	24.0	1.2	23.7	24.9
Italy	4.8	34.9	39.7	5.1	39.8	44.9	4.4	10.0	14.4	5.7	10.5	16.2
Czechoslovakia	1.9	9.1	11.0	1.8	15.2	17.0	6.2	11.1	17.3	3.4	8.0	11.4
Austria	2.1	9.3	11.4	2.8	10.2	13.0	2.5	5.8	8.3	1.9	6.6	8.5
All countries	1.2	17.0	18.2	1.5	18.4	19.9	1.4	16.0	17.4	1.5	16.3	17.8

TABLE 24.—Number and percentage of total applicants who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Number of visas refused for—			Per cent of applicants examined who were refused for—		
	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium: Antwerp.....	1	2	3	0.1	0.3	0.4
England:						
Liverpool.....	14	332	346	.5	13.3	13.8
London.....	10	204	214	.2	5.8	6.0
Southampton.....	11	45	56	1.0	4.1	5.1
Irish Free State:						
Cobh.....	48	314	362	1.8	11.3	13.1
Dublin.....	61	449	510	1.4	10.3	11.7
Northern Ireland: Belfast.....	40	188	228	3.2	15.2	18.4
Scotland: Glasgow.....	17	186	203	.4	5.7	6.1
Germany:						
Berlin.....	68	664	732	1.6	16.0	17.6
Bremen.....	13	81	94	.8	5.5	6.3
Cologne.....	52	376	428	1.3	10.0	11.3
Hamburg.....	10	32	42	.8	2.6	3.4
Stuttgart.....	43	149	192	.7	2.5	3.2
Holland: Rotterdam.....	10	192	202	.6	10.9	11.5
Poland: Warsaw.....	181	1,087	1,268	1.7	10.7	12.4
Denmark: Copenhagen.....	2	54	56	.1	3.7	3.8
Norway:						
Bergen.....	3	124	127	.3	11.3	11.6
Oslo.....	15	539	554	.5	20.4	20.9
Sweden:						
Goteborg.....	11	54	65	.9	4.3	5.2
Stockholm.....	15	79	94	1.3	7.2	8.5
Italy:						
Genoa.....	168	68	236	6.2	2.5	8.7
Naples.....	378	378	756	3.5	3.5	7.0
Palermo.....	345	7	352	8.7	.2	8.9
Czechoslovakia: Prague.....	80	145	225	2.8	5.2	8.0
Austria: Vienna.....	26	42	68	2.4	3.8	6.2
All countries.....	1,622	5,791	7,413	2.1	7.5	9.6

TABLE 25.—Percentage distribution of male and female applicants who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Per cent of males who were refused visas for—			Per cent of females who were refused visas for—		
	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium: Antwerp.....	0.3	0.3	0.6	0	0.3	0.3
England:						
Liverpool.....	.5	15.1	15.6	.5	12.0	12.5
London.....	.3	6.1	6.4	.3	5.6	5.9
Southampton.....	.9	3.6	4.5	1.1	4.7	5.8
Irish Free State:						
Cobh.....	1.4	12.2	13.6	1.8	10.8	12.6
Dublin.....	1.0	11.2	12.2	1.6	9.9	11.5
Northern Ireland: Belfast.....	1.1	13.6	14.7	4.4	16.1	20.5
Scotland: Glasgow.....	.5	9.8	10.3	.3	1.9	2.2
Germany:						
Berlin.....	1.6	19.1	20.7	1.6	13.5	15.1
Bremen.....	.9	5.7	6.6	.8	5.2	6.0
Cologne.....	1.1	9.7	10.8	1.4	10.3	11.7
Hamburg.....	.6	3.6	4.2	.9	1.6	2.5
Stuttgart.....	.5	2.9	3.4	.8	2.3	3.1
Holland: Rotterdam.....	.5	13.0	13.5	.6	8.6	9.2
Poland: Warsaw.....	1.4	13.4	14.8	2.2	7.2	9.4
Denmark: Copenhagen.....	.2	4.3	4.5	0	2.8	2.8

TABLE 25.—Percentage distribution of male and female applicants who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931—Continued

Country and consular office	Per cent of males who were refused visas for—			Per cent of females who were refused visas for—		
	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Norway:						
Bergen.....	.1	13.0	13.1	.3	9.6	9.9
Oslo.....	.8	19.2	20.0	.3	21.1	21.4
Sweden:						
Goteborg.....	1.2	4.6	5.8	.6	4.1	4.7
Stockholm.....	1.4	7.3	8.7	1.3	7.1	8.4
Italy:						
Genoa.....	6.1	4.4	10.5	6.2	1.6	7.8
Naples.....	2.9	5.8	8.7	4.0	1.9	5.9
Palermo.....	7.0	.3	7.3	8.7	.1	8.8
Czechoslovakia: Prague.....	3.3	6.0	9.3	2.4	4.4	6.8
Austria: Vienna.....	2.2	4.5	6.7	2.6	3.3	5.9
All countries.....	1.8	9.1	10.9	2.3	6.3	8.6

TABLE 26.—Percentage of male and female applicants notified for class B disabilities who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country and consular office	Number of applicants notified for class B conditions			Number of applicants who were refused for class B conditions			Per cent of applicants notified who were refused for class B conditions		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Belgium: Antwerp.....	40	33	73	1	1	2	2.5	3.3	2.7
England:									
Liverpool.....	212	301	513	158	174	332	74.5	57.8	64.9
London.....	211	360	571	94	110	204	45.5	30.8	35.7
Southampton.....	59	79	138	20	25	45	34.0	31.6	32.6
Irish Free State:									
Cobh.....	184	320	504	125	189	314	67.9	59.0	62.3
Dublin.....	222	452	674	164	285	449	73.8	63.0	66.6
Northern Ireland: Belfast.....	115	258	373	59	129	188	51.3	50.0	50.4
Scotland: Glasgow.....	213	160	373	138	48	186	64.7	30.0	49.8
Germany:									
Berlin.....	551	581	1,132	360	304	664	65.6	52.3	58.6
Bremen.....	87	113	200	38	43	81	43.6	33.6	40.5
Cologne.....	249	333	582	161	215	376	64.6	64.5	64.6
Hamburg.....	52	52	104	22	10	32	42.6	19.2	30.7
Stuttgart.....	325	526	851	69	80	149	21.2	15.1	17.5
Holland: Rotterdam.....	189	151	340	123	69	192	65.0	81.4	56.4
Poland: Warsaw.....	978	709	1,687	759	328	1,087	77.6	46.2	64.4
Denmark: Copenhagen.....	56	90	146	34	20	54	61.7	22.2	37.0
Norway:									
Bergen.....	119	118	237	71	53	124	59.6	45.7	52.3
Oslo.....	275	463	738	201	338	539	73.0	73.0	73.0
Sweden:									
Goteborg.....	80	98	178	27	27	54	33.7	27.5	30.3
Stockholm.....	67	106	173	36	43	79	53.7	40.5	45.6
Italy:									
Genoa.....	215	362	577	38	30	68	17.6	8.3	11.7
Naples.....	734	1,039	1,773	260	118	378	35.4	11.3	21.3
Palermo.....	366	608	974	6	1	7	1.6	.1	.7
Czechoslovakia: Prague.....	123	196	319	76	69	145	61.8	35.2	45.4
Austria: Vienna.....	47	58	105	24	18	42	51.0	31.0	40.0
All countries.....	5,769	7,566	13,335	3,064	2,727	5,791	53.1	36.0	43.4

TABLE 27.—Number and percentage of total quota applicants examined who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country	Total number of quota applicants examined	Number who were refused visas			Per cent of number examined who were refused visas		
		Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium.....	415	1	2	3	0.2	0.4	0.6
England.....	5,777	33	543	576	.5	9.4	9.9
Irish Free State.....	6,647	103	734	837	1.5	11.0	12.5
Northern Ireland.....	1,117	37	180	217	3.3	16.1	19.4
Scotland.....	3,295	15	181	196	.4	5.4	5.8
Germany.....	14,845	158	1,270	1,428	1.0	8.5	9.5
Holland.....	1,578	9	185	194	.5	11.7	12.2
Poland.....	8,223	136	1,021	1,157	1.6	12.4	14.0
Denmark.....	1,236	2	52	54	.1	4.2	4.3
Norway.....	3,376	17	653	670	.5	19.3	19.8
Sweden.....	1,997	23	127	150	1.1	6.3	7.4
Italy.....	5,653	285	296	581	5.0	5.2	10.2
Czechoslovakia.....	1,840	35	87	122	1.9	4.7	6.6
Austria.....	811	20	35	55	2.4	4.3	6.7
All countries.....	56,810	874	5,366	6,240	1.5	9.4	10.9

TABLE 28.—Number and percentage of total nonquota applicants who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country	Total number of non-quota applicants examined	Number who were refused visas			Per cent of number who were refused visas		
		Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium.....	194	0	0	0	0	0	0
England.....	1,254	2	38	40	.1	3.0	3.1
Irish Free State.....	438	6	29	35	1.3	6.6	7.9
Northern Ireland.....	117	3	8	11	2.5	6.8	9.3
Scotland.....	632	2	5	7	.3	.8	1.1
Germany.....	1,586	25	32	57	1.5	2.0	3.5
Holland.....	162	0	7	7	0	4.3	4.3
Poland.....	1,925	45	66	111	2.3	3.4	5.7
Denmark.....	241	0	2	2	0	.8	.8
Norway.....	361	1	10	11	.3	2.7	3.0
Sweden.....	329	3	6	9	.9	1.8	2.7
Italy.....	11,525	606	157	763	5.2	1.3	6.5
Czechoslovakia.....	968	44	58	102	4.5	6.0	10.5
Austria.....	270	6	7	13	2.2	2.6	4.8
All countries.....	20,002	743	425	1,168	3.7	2.1	5.8

TABLE 29.—Percentage distribution of the total quota applicants notified for each class of disabilities who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country	Number notified			Number refused visas			Per cent of notified refused visas		
	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium.....	1	47	48	1	2	3	100.0	2.0	6.2
England.....	33	1,028	1,061	33	543	576	100.0	52.8	54.2
Irish Free State.....	103	1,076	1,179	103	734	837	100.0	68.2	70.9
Northern Ireland.....	37	338	375	37	180	217	100.0	53.2	57.9
Scotland.....	15	331	346	15	181	196	100.0	54.6	56.6
Germany.....	158	2,612	2,770	158	1,270	1,428	100.0	48.6	51.5
Holland.....	9	318	327	9	185	194	100.0	53.1	59.3
Poland.....	136	1,512	1,648	136	1,021	1,157	100.0	67.5	70.2
Denmark.....	2	116	118	2	52	54	100.0	44.8	45.7
Norway.....	17	862	879	17	653	670	100.0	75.7	76.2
Sweden.....	23	274	297	23	127	150	100.0	46.3	50.5
Italy.....	285	2,128	2,413	285	296	581	100.0	13.9	24.0
Czechoslovakia.....	35	228	263	35	87	122	100.0	38.1	46.3
Austria.....	20	88	108	20	35	55	100.0	38.6	50.9
All countries.....	874	10,958	11,832	874	5,366	6,240	100.0	48.9	52.7

TABLE 30.—Percentage distribution of total nonquota applicants notified for each class of disability who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country	Number notified			Number refused visas			Per cent of notified refused visas		
	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Belgium.....	0	26	26	0	0	0	0	13.3	13.3
England.....	2	194	196	2	38	40	100.0	15.4	15.6
Irish Free State.....	6	98	104	6	29	35	100.0	29.5	33.6
Northern Ireland.....	3	35	38	3	8	11	100.0	22.8	28.9
Scotland.....	2	41	43	2	5	7	100.0	12.2	16.2
Germany.....	25	293	318	25	32	57	100.0	10.9	17.9
Holland.....	0	30	30	0	7	7	0	23.3	23.3
Poland.....	45	175	220	45	66	111	100.0	37.7	50.4
Denmark.....	0	30	30	0	2	2	0	6.6	6.6
Norway.....	1	113	114	1	10	11	100.0	8.8	9.6
Sweden.....	3	77	80	3	6	9	100.0	7.7	11.2
Italy.....	606	1,196	1,802	606	157	763	100.0	13.1	42.3
Czechoslovakia.....	44	90	134	44	58	102	100.0	48.8	76.1
Austria.....	6	17	23	6	7	13	100.0	41.1	56.5
All countries.....	743	2,415	3,158	743	425	1,168	100.0	17.5	36.9

TABLE 31.—Percentage distribution of total quota and nonquota applicants of each sex examined who were refused visas on medical notification from July 1, 1930, to June 30, 1931

Country	Quota						Nonquota					
	Male			Female			Male			Female		
	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B
Belgium.....	0.4	0.4	0.8	0	0.5	0.5	0	0	0	0	0	0
England.....	.5	10.0	10.5	.4	8.8	9.2	.1	3.2	3.3	.1	2.8	2.9
Irish Free State.....	1.2	12.0	13.2	1.7	10.5	12.2	1.0	8.4	9.4	1.6	5.2	6.8
Northern Ireland.....	1.2	14.7	15.9	4.3	16.8	21.1	0	4.2	4.2	4.3	8.5	12.8
Scotland.....	.5	11.9	12.4	.4	2.1	2.5	.3	1.4	1.7	.2	.3	.5
Germany.....	.9	9.7	10.6	1.0	7.6	8.6	1.5	2.7	4.2	1.5	1.4	2.9
Holland.....	.5	13.8	14.3	.5	.9	1.4	0	4.7	4.7	0	3.9	3.9
Poland.....	1.2	14.5	15.7	2.3	9.3	11.6	2.8	6.3	9.1	2.0	1.6	3.6
Norway.....	.3	4.8	5.1	0	3.4	3.4	0	.9	.9	0	.6	.6
Denmark.....	.6	18.5	19.1	.4	19.9	20.3	.6	3.9	4.5	0	1.9	1.9
Sweden.....	1.4	6.4	7.8	.9	6.3	7.2	.5	2.9	3.4	1.2	.6	1.8
Italy.....	4.8	7.0	11.8	5.1	3.7	8.8	4.4	3.0	7.4	5.6	.4	6.0
Czechoslovakia.....	1.9	5.4	7.3	1.8	4.4	6.2	.6	.8	1.4	.3	.4	.7
Austria.....	2.1	4.9	7.0	2.8	3.6	6.4	2.5	2.5	5.0	1.9	2.6	4.5
All countries.....	1.8	9.5	11.3	1.5	6.9	8.4	1.0	3.2	4.2	1.3	2.1	3.4

TABLE 32.—Percentage distribution of total quota and nonquota applicants of each sex notified who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country	Quota						Nonquota					
	Male			Female			Male			Female		
	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B	Class A	Class B	Classes A and B
Belgium.....	100.0	4.0	7.6	0	4.5	4.5	0	0	0	0	0	0
England.....	100.0	63.3	64.5	100.0	46.1	47.7	100.0	28.8	24.7	100.0	16.3	17.1
Irish Free State.....	100.0	73.9	75.8	100.0	65.2	68.5	100.0	44.4	47.3	100.0	20.9	25.7
Northern Ireland.....	100.0	56.4	58.4	100.0	51.9	57.6	0	14.2	14.2	100.0	28.5	37.5
Scotland.....	100.0	72.0	72.9	100.0	32.4	36.3	100.0	14.8	17.8	100.0	7.1	13.1
Germany.....	100.0	55.5	57.8	100.0	43.3	46.7	100.0	13.9	20.4	100.0	8.2	15.7
Holland.....	100.0	69.5	70.4	100.0	47.8	49.3	0	23.5	23.5	0	23.1	23.1
Poland.....	100.0	79.8	81.0	100.0	49.7	55.3	100.0	54.1	63.2	100.0	22.2	38.6
Denmark.....	100.0	64.7	66.0	0	29.2	29.2	0	20.0	20.0	0	4.0	4.0
Norway.....	100.0	76.2	76.8	100.0	75.4	75.8	100.0	13.3	15.2	0	5.8	5.8
Sweden.....	100.0	54.2	59.2	100.0	41.3	44.6	100.0	12.5	14.6	100.0	2.7	7.6
Italy.....	100.0	20.0	30.0	100.0	9.4	19.1	100.0	29.6	51.3	100.0	4.2	37.9
Czechoslovakia.....	100.0	55.0	62.8	100.0	29.0	36.7	100.0	74.4	83.5	100.0	55.3	68.6
Austria.....	100.0	52.5	61.2	100.0	29.1	42.3	100.0	42.8	60.0	100.0	40.0	53.8
All countries.....	100.0	56.9	60.3	100.0	39.6	43.8	100.0	27.2	32.5	100.0	17.0	24.9

TABLE 33.—Number and percentage of quota and nonquota applicants of each sex who were refused visas for mental conditions from July 1, 1930, to June 30, 1931

Country	Quota						Nonquota					
	Male			Female			Male			Female		
	Number examined	Number re-refused	Per cent re-refused	Number examined	Number re-refused	Per cent re-refused	Number examined	Number re-refused	Per cent re-refused	Number examined	Number re-refused	Per cent re-refused
Belgium.....	210	1	0.4	205	0	0	88	0	0	106	0	0
England.....	2,501	9	.3	3,276	9	.2	623	0	0	631	1	.1
Irish Free State.....	2,279	13	.5	4,368	62	1.4	189	2	1.0	249	2	.8
Northern Ireland.....	387	4	1.0	730	21	2.8	47	0	0	70	2	2.8
Scotland.....	1,123	5	.4	2,172	9	.4	280	1	.3	352	1	.2
Germany.....	6,493	42	.6	8,352	58	.6	696	6	.8	890	13	1.4
Holland.....	857	3	.3	721	2	.2	85	0	0	77	0	0
Poland.....	4,911	5	.1	3,312	16	.4	730	6	.8	1,195	5	.4
Denmark.....	679	0	0	557	0	0	105	0	0	136	0	0
Norway.....	1,436	5	.3	1,940	3	.1	153	0	0	208	0	0
Sweden.....	905	7	.7	1,092	5	.4	170	0	0	159	1	.6
Italy.....	2,560	33	1.2	3,093	58	1.8	4,170	31	.7	7,355	115	1.5
Czechoslovakia.....	872	4	.4	968	4	.4	385	6	1.5	583	18	3.0
Austria.....	428	4	.9	383	8	2.0	119	1	.8	151	1	.6
All countries.....	25,641	135	.5	31,169	255	.8	7,840	53	.6	12,162	159	1.3

TABLE 34.—Number and character of the more serious mandatorily excludable conditions notified from July 1, 1930, to June 30, 1931

Nature of defect	Country													Total	
	Belgium	England	Irish Free State	Northern Ireland	Scotland	Germany	Holland	Poland	Denmark	Norway	Sweden	Italy	Czechoslovakia		Austria
Alcoholism.....			1												1
Dementia Praecox.....						3									3
Epilepsy.....	1	1													2
Favus.....						1	1					50			52
Feeble-mindedness.....	1	1	4			1	4	7		1	3	43	4	1	70
Imbecility.....			1			5		1				2			9
Insanity.....	1	1	1	1	1	4		2		1	1	1			13
Idiocy.....						1		1				2			3
Loathsome contagious diseases.....			4	1		2		40				53	1	1	102
Mentally defective.....			8	70	21	14		85		21		4	8	174	26
Mentally depressed.....						1									1
Mentally retarded.....			4			3									7
Organic nervous diseases.....												3			3
Psychopathic inferiority.....	4	4	5	1		18	1	2		2	1	10	2	5	55
Senile dementia.....						2						3			6
Trachoma.....	5	5	3			3	1	78				487	39	2	623
Tuberculosis, pulmonary.....	10	16	6			28	2	25		4	5	40	8	6	150
Tuberculosis, other forms.....			2	1		6		3			1	1	19	2	35
Veneral diseases.....	1	1	1			24	1	1	2	5	7	4		1	48
Total.....	1	35	109	40	17	186	10	181	2	18	26	891	80	26	1,622

TABLE 35.—Percentage of decrease in the number examined at the different stations during the year ending June 30, 1931, as compared with the year ending June 30, 1930

Country	Per cent	Country	Per cent
Belgium.....	58.55	Poland.....	9.69
England.....	65.42	Sweden.....	35.26
Irish Free State.....	64.88	Italy.....	32.83
Northern Ireland.....	86.87	Czechoslovakia.....	46.75
Scotland.....	82.17		
Germany.....	43.67	All countries.....	50.87
Holland.....	54.51		

Two countries report an increase, viz, Denmark, 11.30 per cent, and Norway, 25.67 per cent.

IMMIGRATION ON THE WESTERN HEMISPHERE

CANADA, CUBA, AND MEXICO

The system of the medical examination of applicants for visas at American consulates, similar to that in effect at European ports, was inaugurated at certain ports in Canada and at Habana, Cuba, and Mexico City, Mexico, during the fiscal year; and at the request of the Department of State, medical officers of the Public Health Service were detailed to American consulates at those ports to act as technical advisers to the consuls. Following is a list of these ports, together with the dates on which this work was inaugurated: In Canada: Hamilton, January 12, 1931; Ottawa, December 11, 1930; Quebec, October, 1930; Toronto, February 2, 1931; Vancouver, October 1, 1930; Windsor, October 16, 1930; Winnipeg, November 1, 1930; Yarmouth, June 29, 1931. This system of the medical examination of applicants for immigration visas had been inaugurated at Montreal during the preceding fiscal year. In Cuba: Habana, January 12, 1931. In Mexico: Mexico City, December 1, 1930.

The total number of applicants examined by medical officers of the Public Health Service attached to American consulates as technical advisers since the inauguration of this system was 24,020. Of this number, 23,398 were examined at Canadian ports; 233 at Habana, Cuba; and 389 at Mexico City, Mexico. Of the total applicants examined 180 were notified to the consul as being afflicted with a disease or defect listed under class A as mandatorily excludable; 2,287 were reported as afflicted with a disease or condition listed under class B, as liable to affect their ability to earn a living.

TABLE 36.—Distribution, according to class, of applicants for immigration visas who were medically examined from July 1, 1930, to June 30, 1931

Country and consular office	Total applicants examined	Number of applicants in each class			Per cent of applicants in each class		
		Quota	Non-quota	Non-immigrants	Quota	Non-quota	Non-immigrants
Cuba: Habana.....	233	46	164	23	19.7	70.4	9.9
Mexico: Mexico City.....	389	140	249	0	36.0	64.0	0
Canada:							
Hamilton.....	847	711	123	13	83.9	14.5	1.5
Montreal.....	8,275	3,853	2,880	1,542	46.5	34.8	18.7
Ottawa.....	403	144	259	0	35.7	64.3	0
Quebec.....	5,937	176	268	5,493	3.0	4.5	92.5
Toronto.....	1,803	1,313	488	2	72.8	27.1	.1
Vancouver.....	658	288	370	0	43.8	56.2	0
Windsor.....	3,448	2,116	1,327	5	61.3	38.6	.1
Winnipeg.....	1,258	387	613	258	30.8	48.7	20.5
Yarmouth.....	769	13	754	2	1.7	98.0	.3
All Canadian.....	23,398	9,001	7,082	7,315	38.5	30.3	31.2
All stations.....	24,020	9,187	7,495	7,338	38.3	31.2	30.5

TABLE 37.—*Distribution, according to sex, of applicants for immigration visas who were medically examined from July 1, 1930, to June 30, 1931*

Country and consular office	Number of each sex examined		Per cent of each sex examined	
	Male	Female	Male	Female
Cuba: Habana.....	107	126	46.0	54.0
Mexico: Mexico City.....	193	196	49.6	50.4
Canada:				
Hamilton.....	605	242	71.4	28.6
Montreal.....	4,879	3,396	59.0	41.0
Ottawa.....	188	215	46.6	53.4
Quebec.....	3,442	2,495	58.0	42.0
Toronto.....	966	837	53.5	46.5
Vancouver.....	354	304	53.8	46.2
Windsor.....	1,982	1,466	57.6	42.4
Winnipeg.....	690	568	54.7	45.2
Yarmouth.....	231	538	30.0	70.3
All Canadian.....	13,337	10,061	57.9	43.0
All stations.....	13,637	10,383	58.1	44.4

TABLE 38.—*Number and percentage of applicants medically examined who were notified for different classes of disabilities July 1, 1930, to June 30, 1931*

Country and consular office	Number notified for—			Per cent of applicants examined notified for—		
	Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Cuba: Habana.....	10	56	66	4.3	24.0	28.3
Mexico: Mexico City.....	9	16	25	2.3	4.1	6.4
Canada:						
Hamilton.....	7	216	223	.8	25.5	26.3
Montreal.....	62	858	920	.7	10.4	11.1
Ottawa.....	2	62	64	.5	15.4	15.9
Quebec.....	4	207	211	.1	3.0	3.5
Toronto.....	37	157	194	2.1	8.7	10.8
Vancouver.....	5	135	140	.8	25.5	21.3
Windsor.....	31	423	454	.9	12.3	13.2
Winnipeg.....	8	154	162	.6	12.2	12.8
Yarmouth.....	5	3	8	.7	.4	1.1
All Canadian.....	161	2,215	2,376	.7	9.5	10.2
All stations.....	180	2,287	2,467	.8	9.2	10.0

TABLE 39.—*Percentage distribution of male and female applicants examined notified according to class of disability, from July 1, 1930, to June 30, 1931*

Country and consular office	Per cent of applicants who had—		Per cent of males who had—		Per cent of females who had—	
	Class A conditions	Class B conditions	Class A conditions	Class B conditions	Class A conditions	Class B conditions
Cuba: Habana.....	4.3	24.0	3.7	30.8	4.8	18.2
Mexico: Mexico City.....	2.3	4.1	2.0	4.1	2.5	4.1
Canada:						
Hamilton.....	3.2	96.8	2.2	76.7	.9	20.1
Montreal.....	.7	10.4	.5	6.0	.3	5.0
Ottawa.....	.5	15.4	.5	17.6	.5	13.5
Quebec.....	.1	3.4	.03	2.0	.2	1.6
Toronto.....	2.1	8.7	.9	5.7	1.1	3.1
Vancouver.....	3.6	96.4	2.1	53.6	1.4	42.1
Windsor.....	.9	12.3	.7	13.1	1.3	10.8
Winnipeg.....	.6	12.2	.8	12.7	.3	11.6
Yarmouth.....	.7	.4	.5	0	.1	.4
All Canadian.....	.7	9.4	.7	10.1	.7	8.7
All stations.....	.7	9.5	.7	13.3	.7	8.7

TABLE 40.—Number and percentage of quota applicants examined who were notified for different classes of disabilities July 1, 1930, to June 30, 1931

Country and consular office	Total number quota applicants examined	Number notified for—			Per cent of total examined who were notified for—		
		Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Cuba: Habana.....	46	4	15	19	8.7	32.7	41.4
Mexico: Mexico City.....	140	6	8	14	4.3	5.7	10.0
Canada:							
Hamilton.....	711	6	186	192	.8	38.0	38.9
Montreal.....	3,853	42	424	466	1.1	11.0	12.1
Ottawa.....	144	1	24	25	.1	16.7	17.4
Quebec.....	176	0	20	20	0	11.4	11.4
Toronto.....	1,313	27	106	133	2.1	8.1	10.1
Vancouver.....	288	4	54	58	2.9	38.6	41.4
Windsor.....	2,116	22	271	293	1.0	12.8	13.8
Winnipeg.....	387	1	67	68	.2	17.3	17.5
Yarmouth.....	13	0	0	0	0	0	0
All Canadian.....	9,001	103	1,152	1,255	1.1	12.8	13.9
All stations.....	9,187	113	1,175	1,288	1.2	12.8	14.0

TABLE 41.—Number and percentage of nonquota applicants examined who were notified for different classes of disabilities July 1, 1930, to June 30, 1931

Country and consular office	Total number nonquota applicants examined	Number notified for—			Per cent of total examined who were notified for—		
		Class A conditions	Class B conditions	Total, classes A and B	Class A conditions	Class B conditions	Total, classes A and B
Cuba: Habana.....	164	6	36	42	3.6	22.0	25.6
Mexico: Mexico City.....	249	3	8	11	1.2	3.2	4.4
Canada:							
Hamilton.....	123	1	30	31	.08	24.4	24.5
Montreal.....	2,880	12	375	387	.4	13.0	13.4
Ottawa.....	259	1	38	39	.4	14.7	15.1
Quebec.....	268	4	103	107	1.5	38.4	40.0
Toronto.....	488	9	51	60	1.8	10.5	12.3
Vancouver.....	370	1	81	82	.3	21.9	22.2
Windsor.....	1,327	9	147	156	.7	11.0	11.7
Winnipeg.....	613	2	72	74	.3	11.7	12.0
Yarmouth.....	754	5	3	8	.7	.4	1.1
All Canadian.....	7,082	44	900	944	.6	12.7	13.3
All stations.....	7,495	53	944	997	.7	12.6	13.3

TABLE 42.—Percentage distribution of total quota and nonquota applicants of each sex examined who were notified for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Quota						Nonquota					
	Male			Female			Male			Female		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	12.5	25.0	37.5	4.5	40.9	45.4	1.3	30.4	31.7	5.9	14.1	20.0
Mexico: Mexico City.....	2.5	7.6	10.1	3.3	3.3	6.6	1.8	1.8	3.5	.8	4.4	5.2
Canada:												
Hamilton.....	.5	18.5	19.0	.2	3.4	3.7	.1	1.7	1.8	0	1.9	1.9
Montreal.....	1.0	10.0	11.0	1.0	13.0	14.0	.6	16.0	17.0	1.0	23.0	23.0
Ottawa.....	0	.2	.2	0	.1	.1	0	.2	.2	0	.2	.2
Quebec.....	0	0	0	0	0	0	1.1	4.8	5.9	.3	13.4	13.7
Toronto.....	.9	5.9	6.9	1.1	2.1	3.3	.8	4.9	5.7	1.0	5.5	6.6
Vancouver.....	1.4	53.6	55.7	1.4	16.4	17.9	.7	31.4	32.1	0	26.4	26.4
Windsor.....	.8	14.1	14.9	1.5	10.3	11.8	.2	10.8	11.0	1.1	11.2	12.3
Winnipeg.....	.2	10.0	10.3	0	7.2	7.2	.1	6.2	6.3	.1	5.5	5.7
Yarmouth.....	0	0	0	0	0	0	.5	0	.5	.1	.4	.5
All Canadian.....	1.0	13.1	14.1	1.4	12.2	13.6	.7	14.1	14.8	.5	11.7	12.2
All stations.....	1.0	13.5	14.5	1.5	12.2	13.7	.8	14.1	14.9	.6	11.5	12.1

TABLE 43.—Number and percentage of total applicants examined who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Number of visas refused for—			Per cent of applicants examined who were refused visas for—		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	10	6	16	4.3	2.6	6.9
Mexico: Mexico City.....	9	2	11	2.3	.5	2.8
Canada:						
Hamilton.....	7	187	194	.8	22.1	22.9
Montreal.....	62	539	601	.7	6.5	7.3
Ottawa.....	2	50	52	.5	12.4	12.9
Quebec.....	0	49	49	0	.8	.8
Toronto.....	37	106	143	2.1	5.9	7.9
Vancouver.....	5	67	72	3.6	47.7	51.4
Windsor.....	31	69	100	0	2.0	2.9
Winnipeg.....	8	2	10	.6	.1	.7
Yarmouth.....	5	0	5	.7	0	.7
All Canadian.....	157	1,069	1,226	.7	4.6	5.2
All stations.....	176	1,077	1,253	.7	4.5	5.2

TABLE 44.—Percentage distribution of male and female applicants examined who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Percentage of males who were refused visas for—			Percentage of females who were refused visas for—		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	3.7	4.7	8.4	4.7	0.8	5.5
Mexico: Mexico City.....	.6	0	2.0	2.7	1.0	3.5
Canada:						
Hamilton.....	.6	18.7	19.2	.2	3.4	3.6
Montreal.....	.8	6.2	7.3	6.0	6.5	7.1
Ottawa.....	.5	16.0	16.5	.5	9.3	9.8
Quebec.....	0	13.1	13.1	0	4.8	4.8
Toronto.....	.9	4.7	5.6	1.1	1.2	2.3
Vancouver.....	2.1	32.1	34.3	1.4	15.7	17.1
Windsor.....	.7	.3	1.0	1.3	.1	1.4
Winnipeg.....	.8	.1	1.0	.3	.1	.5
Yarmouth.....	.5	0	.5	.1	0	.1
All Canadian.....	.7	6.9	7.6	.7	4.3	5.0
All stations.....	.7	6.8	7.5	.8	4.2	5.0

TABLE 45.—Number and percentage of male and female applicants notified for class B disabilities who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country and consular office	Number of applicants notified for class B condition			Number applicants refused visas for class B conditions			Per cent of applicants notified who were refused visas for class B		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Cuba: Habana.....	33	23	56	5	1	6	15.2	4.3	10.7
Mexico: Mexico City.....	8	8	16	0	2	2	0	25.0	12.5
Canada:									
Hamilton.....	171	45	216	157	29	186	91.8	64.4	86.1
Montreal.....	464	394	858	317	222	539	68.3	56.8	62.8
Ottawa.....	33	29	62	30	20	50	91.0	69.0	81.0
Quebec.....	146	61	207	36	13	49	24.7	21.3	23.7
Toronto.....	102	55	157	84	22	106	82.4	40.0	67.5
Vancouver.....	75	60	135	45	22	67	33.3	16.3	42.2
Windsor.....	261	162	423	220	77	297	84.3	47.5	70.1
Winnipeg.....	88	66	154	1	1	2	1.1	1.5	1.3
Yarmouth.....	0	3	3	0	0	0	0	0	0
All Canadians.....	1,340	875	2,215	890	406	1,296	66.4	46.4	58.5
All stations.....	1,351	906	2,257	895	409	1,304	64.8	45.1	57.0

TABLE 46.—Number and percentage of total quota applicants examined who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Total number of quota applicants examined	Number who were refused visas			Per cent of number examined who were refused visas		
		Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Havana.....	46	4	3	7	8.6	6.5	15.2
Mexico: Mexico City.....	140	6	0	6	4.3	0	4.3
Canada:							
Hamilton.....	711	6	178	184	.84	25.0	25.0
Montreal.....	3,853	42	350	392	1.1	9.1	10.2
Ottawa.....	144	1	21	22	.7	14.6	15.3
Quebec.....	0	0	0	0	0	0	0
Toronto.....	1,313	27	86	113	2.1	6.6	8.6
Vancouver.....	176	4	35	39	5.6	48.6	54.2
Windsor.....	2,116	22	40	62	1.0	2.9	3.9
Winnipeg.....	387	1	0	1	.2	0	.2
Yarmouth.....	13	0	0	0	0	0	0
All Canadian.....	8,713	103	710	813	1.2	8.3	9.5
All stations.....	8,899	113	713	826	1.3	8.2	9.5

TABLE 47.—Number and percentage of total nonquota applicants examined who were refused visas on medical notification for different classes of disabilities from July 1, 1930, to June 30, 1931

Country and consular office	Total number of nonquota applicants examined	Number who were refused visas			Per cent of number examined who were refused visas		
		Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Havana.....	164	6	3	9	3.6	1.8	5.4
Mexico: Mexico City.....	249	3	2	5	1.2	.8	2.0
Canada:							
Hamilton.....	123	1	8	9	.1	6.5	6.6
Montreal.....	2,280	12	188	200	.4	8.4	8.8
Ottawa.....	259	1	29	30	.3	11.2	11.5
Quebec.....	268	0	49	49	0	18.2	18.2
Toronto.....	488	9	20	29	1.8	4.1	5.9
Vancouver.....	370	1	32	33	.3	8.7	9.0
Windsor.....	1,332	9	29	38	.7	2.2	2.9
Winnipeg.....	613	2	4	6	.3	.3	.6
Yarmouth.....	754	5	0	5	.7	0	.7
All Canadian.....	6,487	40	357	397	.6	5.5	6.1
All stations.....	6,900	49	362	411	.7	5.3	6.1

TABLE 48.—Percentage distribution of the total quota applicants notified for each class of disabilities who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country and consular office	Number notified			Number refused visas			Per cent of notified cases refused visas		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	4	15	19	4	3	7	100.0	20.0	36.8
Mexico: Mexico City.....	6	8	14	6	0	6	100.0	0	42.8
Canada:									
Hamilton.....	6	186	192	6	178	184	100.0	95.7	95.8
Montreal.....	42	424	466	42	350	392	100.0	82.5	84.0
Ottawa.....	1	24	25	1	21	22	100.0	87.0	88.0
Quebec.....	0	0	0	0	0	0	0	0	0
Toronto.....	27	106	133	27	86	113	100.0	81.1	85.0
Vancouver.....	4	54	58	4	35	39	100.0	59.3	66.1
Windsor.....	22	271	293	22	226	248	100.0	83.3	84.0
Winnipeg.....	1	67	68	1	0	1	100.0	0	1.4
Yarmouth.....	0	0	0	0	0	0	0	0	0
All Canadian.....	103	1,132	1,235	103	896	999	100.0	79.2	82.4
All stations.....	113	1,155	1,268	113	899	1,012	100.0	77.1	80.0

TABLE 49.—Percentage distribution of the total nonquota applicants notified for each class of disabilities who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country and consular office	Number notified			Number refused visas			Per cent of notified cases refused visas		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	6	36	42	6	3	9	100.0	8.3	21.4
Mexico: Mexico City.....	3	8	11	3	2	5	100.0	25.0	45.5
Canada:									
Hamilton.....	1	30	31	1	8	9	100.0	26.7	29.0
Montreal.....	12	375	387	12	188	200	100.0	20.1	51.8
Ottawa.....	1	38	39	1	29	30	100.0	76.3	76.3
Quebec.....	0	0	0	0	0	0	0	0	0
Toronto.....	9	51	60	9	20	29	100.0	39.2	48.3
Vancouver.....	1	81	82	1	32	33	100.0	39.5	40.2
Windsor.....	9	147	156	9	29	38	100.0	19.6	24.4
Winnipeg.....	2	72	74	2	2	4	100.0	2.7	5.4
Yarmouth.....	0	0	0	0	0	0	0	0	0
All Canadian.....	35	794	829	35	308	343	100.0	38.8	41.4
All stations.....	44	838	882	44	313	357	100.0	37.4	40.5

TABLE 50.—Percentage distribution of total quota and nonquota applicants of each sex examined who were refused visas on medical notification July 1, 1930, to June 30, 1931

Country and consular office	Quota						Non quota					
	Male			Female			Male			Female		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	12.5	8.3	20.8	4.6	4.6	9.2	1.3	3.8	5.1	5.9	0	5.9
Mexico: Mexico City.....	2.5	0	2.5	6.5	0	6.5	1.7	0	1.7	.7	1.5	2.2
Canada:												
Hamilton.....	.7	27.8	28.5	1.3	15.6	16.9	2.2	8.9	11.1	0	5.1	5.1
Montreal.....	1.0	8.0	9.0	1.0	1.0	11.0	6.0	9.0	10.0	2.0	5.0	5.0
Ottawa.....	1.2	18.5	19.7	0	9.0	9.0	0	14.0	14.0	.7	9.2	9.9
Quebec.....	0	0	0	0	0	0	0	19.2	19.2	0	16.0	16.0
Toronto.....	1.6	9.3	10.9	2.7	2.8	5.5	1.9	6.5	8.4	1.8	2.2	4.0
Vancouver.....	2.8	34.7	37.5	2.8	13.9	16.7	1.4	27.8	29.2	0	16.7	16.7
Windsor.....	.8	12.6	13.4	1.5	6.9	8.4	0	7.2	7.2	.9	3.5	4.4
Winnipeg.....	.4	0	.4	0	0	0	.3	.3	.6	.3	.3	.6
Yarmouth.....	0	0	0	0	0	0	.5	0	.5	.1	0	.1
All Canadian.....	1.6	11.9	13.5	1.4	8.4	9.8	.5	8.1	8.6	.5	3.9	4.4
All stations.....	1.1	11.8	12.9	1.6	8.2	9.8	.6	7.7	8.3	.6	3.8	4.4

TABLE 51.—Percentage distribution of total quota and nonquota applicants of each sex notified who were refused visas on medical grounds from July 1, 1930, to June 30, 1931

Country and consular office	Quota						Nonquota					
	Male			Female			Male			Female		
	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B	Class A	Class B	Total, classes A and B
Cuba: Habana.....	100.0	33.3	55.0	100.0	11.1	20.0	100.0	12.5	16.0	100.0	0	26.2
Mexico: Mexico City.....	100.0	0	25.0	100.0	0	66.6	100.0	0	50.0	100.0	33.3	42.9
Canada:												
Hamilton.....	100.0	97.5	97.5	100.0	86.2	87.1	0	35.7	33.3	0	25.0	25.0
Montreal.....	100.0	84.4	85.6	100.0	80.8	81.4	100.0	56.9	58.5	100.0	56.1	44.8
Ottawa.....	100.0	88.2	88.8	0	85.7	85.7	0	93.7	93.7	100.0	63.6	65.4
Quebec.....	0	0	0	0	0	0	0	19.2	19.2	0	16.0	16.0
Toronto.....	100.0	89.8	80.2	100.0	57.1	74.4	100.0	58.3	57.1	100.0	22.2	32.3
Vancouver.....	100.0	80.6	81.9	100.0	43.5	40.0	100.0	45.5	46.7	0	32.4	32.4
Windsor.....	100.0	89.3	89.9	100.0	67.6	71.8	0	66.7	65.6	100.0	31.3	37.4
Winnipeg.....	100.0	0	2.5	0	0	0	100.0	2.6	5.1	100.0	2.9	5.7
Yarmouth.....	0	0	0	0	0	0	100.0	0	100.0	100.0	0	100.0
All Canadian.....	100.0	90.0	90.7	100.0	61.0	71.9	100.0	57.4	59.5	100.0	34.0	36.5
All stations.....	100.0	90.3	89.7	100.0	67.0	70.8	100.0	54.7	57.2	100.0	33.4	36.5

TABLE 52.—Number and percentage of quota and nonquota applicants of each sex who were refused visas for mental conditions from July 1, 1930, to June 30, 1931

Country and consular office	Quota						Nonquota					
	Male			Female			Male			Female		
	Number examined	Number re-fused	Per cent re-fused	Number examined	Number re-fused	Per cent re-fused	Number examined	Number re-fused	Per cent re-fused	Number examined	Number re-fused	Per cent re-fused
Cuba: Habana.....	24	0	0	22	0	0	79	0	0	85	1	1.2
Mexico: Mexico City.....	79	0	0	61	2	3.3	114	0	0	135	0	0
Canada:												
Hamilton.....	551	2	.4	160	2	1.3	45	0	0	78	0	0
Montreal.....	2,512	1	.04	1,341	11	.8	1,142	1	.1	1,738	2	.12
Ottawa.....	81	1	1.2	63	0	0	107	0	0	152	1	.7
Quebec.....	102	0	0	74	0	0	155	2	1.3	113	0	0
Toronto.....	750	13	1.7	563	11	2.0	214	2	.9	274	1	.4
Vancouver.....	166	0	0	122	2	1.6	188	1	.5	182	0	0
Windsor.....	1,395	9	.6	721	7	1.0	586	6	1.0	741	6	.8
Winnipeg.....	235	1	.4	152	0	0	297	0	0	316	1	.3
Yarmouth.....	4	0	0	9	0	0	226	4	1.8	528	1	.2
All Canadian.....	5,796	27	.5	3,205	33	1.0	2,960	16	.5	4,122	12	.3
All stations.....	5,899	27	.5	3,288	35	1.1	3,153	16	.5	4,342	13	.3

TABLE 53.—Number and character of the more serious mandatorily excludable conditions notified from July 1, 1930, to June 30, 1931

Disease or defect	Cuba: Habana	Mexico: Mexico City	Canada									Total all stations	
			Hamilton	Montreal	Ottawa	Quebec	Toronto	Vancouver	Windsor	Winnipeg	Yarmouth		Total
Alcoholism.....	1												1
Favus.....			1	2				1					4
Feeble-mindedness.....	1		2		1	2							10
Mentally defective.....		2						21					23
Nervous instability.....				1									1
Psychopathic inferiority.....			2			1	2			5	3		13
Senile dementia.....				1									1
Trachoma.....	5	7						1	3				5
Tuberculosis, pulmonary.....	3			1	1			5	1		1		9
Tuberculosis, other forms.....				1					1				2
Venereal diseases:													
Syphilis.....							1				1	1	3
Chancere.....	1							1					2
Gonorrhoea.....			1	2				2					5

REPORTS FROM IMMIGRATION STATIONS

New York (Ellis Island), N. Y.—Medical Director C. H. Lavinder in charge. Post-office and telegraphic address, Ellis Island, N. Y.

The activities of the three administrative divisions, viz, boarding division, line division, and hospital division, at this port have been conducted along the same general lines as in former years. Each of the divisions is supervised by an executive officer under the general supervision of the chief medical officer, and close cooperation is maintained at all times between these three units.

The work of the boarding division is conducted from offices located in the Barge Office Building at the Battery. Because of its central location it is easily accessible to all piers in New York Harbor and other more or less distant points where vessels may dock. Travel time, a most important item, to and

from ships is thus reduced to a minimum, with the result that it is possible to cover all the vessels entering the port without undue delay. The office is on the same floor and contiguous to the suite occupied by the immigration inspector in charge, with whom the medical division must be in close contact at all times for the proper performance of the work. The number of aliens arriving at Ellis Island during the past fiscal year showed considerable decrease as compared with previous years. The economic depression in the United States is largely, if not wholly, responsible for this decreased immigration. Because of these conditions American consuls have exercised their discretion in the granting of visas to only those aliens who could show that they would not, under even extraordinary circumstances, become a public charge after landing in the United States. Following the inauguration of the conduct of the medical examination of prospective immigrants abroad, it became unnecessary to conduct at Ellis Island the medical examination of such third-class or steerage passengers as have been examined abroad, and such persons now receive a confirmatory medical examination on shipboard. Only alien third-class or steerage passengers who have not been medically examined abroad and alien passengers of first and second class who are suspected upon arrival to be afflicted with a certifiable condition are now removed to Ellis Island. The net result of this change in procedure has been to shift the major part of the work from Ellis Island to shipboard, which is taken care of by the boarding division. The hours of duty for medical officers are the same as those fixed by the Commissioner of Immigration for the inspectors, which during the summer months are from 7 a. m. to 9.30 p. m. Four hundred and forty-nine passengers from all classes were remanded to Ellis Island for further medical examination during the fiscal year. The total number of aliens inspected during this period was 205,712.

During the fiscal year, 546,374 alien seamen were medically examined. Of this number, 205,847 were examined intensively in accordance with section 20 (a) of the immigration act of 1924. This examination is designated to detect the mandatory excludable diseases only. Three hundred and fifty-four seamen were remanded to Ellis Island as a result of the above examination. This represents a considerable decrease in the number of cases remanded for the mandatory diseases during the fiscal year as compared with the preceding year. Since the intensive examination of seamen was inaugurated several years ago, officials of the various steamship companies have made every effort to exclude seamen suffering from these diseases as members of their crew, as such seamen are a menace to other members of the crew and passengers and the cost in caring for them in hospital bills and fines is quite a considerable item. Many companies now require their surgeons to make an intensive examination of all crew before they are signed on their vessel, and a similar examination the day before arrival at a United States port.

The line division, situated on First Island, is one of the main administrative divisions of the Public Health Service in its work at Ellis Island. It is located at the east end of the main building on the first floor and has at its disposal about 14 large rooms with the necessary lavatories, etc. The activities of the line division are concerned largely with the medical examination of aliens who were not given an examination abroad by officers of the Public Health Service prior to embarkation; reexamination of aliens held for further medical examination; reexamination of landed aliens, when requested by the immigration authorities; serving on medical boards; giving medical testimony before boards of special inquiry; furnishing the Bureau of Immigration with medical opinion regarding certain aliens, and other miscellaneous duties in connection with the conduct of the medical inspection of aliens. Warrant aliens are brought to Ellis Island for deportation from all parts of the United States. Most of these cases are presented to the medical division for the purpose of determining whether their physical condition is such as to require their detention in the hospital at Ellis Island or in the detention rooms of the Immigration Service. If afflicted with class A or serious class B conditions, they are sent to the hospital for detention prior to deportation; if they are mentally clear and free from contagious diseases, they are sent to the immigration rooms for detention. At the request of the Commissioner of Immigration this examination of warrant cases has been conducted in one of the detention rooms of the Immigration Service, and considerable inconvenience and delay has been avoided through this procedure.

Since the inauguration of the conduct of the medical examination of intending immigrants abroad, Public Health Service officers detailed for this work are

given a final intensive course of training at Ellis Island prior to taking up these duties abroad. This training has proved very beneficial, as the medical officers not only review the laws and regulations in force pertaining to this work, but also are afforded a better understanding of the problems actually confronted by the medical officers on this side in connection with arriving aliens who have had preliminary medical examination abroad prior to securing visa.

Boston, Mass.—Surg. Carl Ramus in charge. Post-office and telegraphic address, 287 Marginal Street, East Boston, Mass.

During the fiscal year, 1,111 vessels were boarded for medical inspection purposes at the port of Boston, and of this number 433 were passenger carriers. The number of aliens arriving on these ships and medically inspected totaled 60,795, including 54,655 seamen and 6,140 passengers. Certifications were issued in the cases of 271 alien passengers and 304 seamen. Seventy-five seamen were certified for class A conditions. The number of alien passengers arriving at this port who had been preexamined totaled 1,697; a total of 4,443 alien passengers were medically inspected at this port who were not pre-examined prior to embarkation.

Among the number arriving at this port who embarked at European ports were many alien domiciled residents of this country returning from a visit to their old homes in Europe. These aliens were provided with reentry permits issued by the Immigration Bureau. A number of aliens from Halifax, Nova Scotia, and St. John's, Newfoundland, arrived at this port. None of these aliens was preexamined before embarkation, and many were landed for permanent admission to this country. By far the largest proportion of aliens arriving at this port are from the British Isles and from the Canadian ports above mentioned, with a few from other northern European countries.

As in the past, alien passengers of all classes are examined at the port of Boston after the steamers are alongside their docks. On large steamers the first and second cabin passengers are inspected at suitably arranged places on board ship, and the tourist and steerage alien passengers are inspected in special rooms provided for this purpose on the docks. The present excellent system of medical examination at foreign ports continues to expedite the routine examination of those aliens who have been preexamined. Alien passengers detained for further medical or mental examination, regardless of class, are sent to the immigration station and, if found necessary, transferred from there to suitable hospitals. All immigration cases sent to hospitals are under the direct care of the physicians and surgeons on the staffs of such hospitals, but progress and diagnosis are carefully followed and checked by the medical officers at this station. Cases found to have mental symptoms are thus doubly checked by State and Federal officers before certification. During the past year 162 cases were admitted to the various hospitals in this district.

In addition to the medical examination of alien passengers, the crews of passenger steamers are medically examined when the ships are alongside the wharves. For the larger passenger steamers, Boston is a port of call for a few hours only, and in order to expedite the medical inspection work the passengers and crews are examined simultaneously.

By special arrangement with the medical officer in charge of the Boston quarantine station there has been this year, as in the past, a certain amount of interchange of immigration and quarantine functions between the two stations. Freight boats, subject to quarantine inspection, when calling at this port, are examined for immigration purposes in conjunction with the regular quarantine inspection. Freight boats, not subject to quarantine inspection, are boarded at the docks by the medical officers from this station and the crews examined for immigration purposes. At the subports of Lynn, Salem, and Beverly, Mass., the combined quarantine and immigration inspection is conducted by the medical officers from this station. This arrangement is not only expeditious to service operations but also considerably facilitates the passage of these vessels through quarantine and immigration, thus conserving a great deal of time for the vessel.

Boston being a port of entry for Chinese, a considerable number of this race are medically examined at the immigration station. In addition to the routine physical examinations, stool examinations are made to ascertain the presence or absence of hookworm and other intestinal parasites. The number of warrant cases brought to the immigration station continues to increase. All such cases receive preliminary medical inspection as soon as they arrive. Any found to have communicable or mental diseases, or otherwise definitely sick, are sent to appropriate hospitals and treated until recovered or deported;

any found sick or injured are treated at the station if found to have only trivial conditions.

Ajo, Ariz.—Acting Asst. Surg. O. B. Patton in charge. Post-office and telegraphic address, Ajo., Ariz.

The number of aliens inspected at this station for the year was 242, a decrease of 13 as compared with the previous year. However, traffic between this port and Mexico has increased considerably, 3,796 aliens and 3,992 United States citizens arrived during the year as compared with 2,800 alien arrivals last year. These aliens for the most part are "local crossers," who enter for a short visit to the United States or to make purchases. The country south of Ajo is a farming country and is rather free from disease. Vaccination for smallpox has been strictly maintained, about 574 vaccinations being performed during the year.

The medical officer detailed to the immigration station for the purpose of making the medical examination of arriving aliens has also been designated to make the required inspection of arrivals by airplane. During the year the total number of such passengers was 14, of which 3 were aliens. Two of these aliens were Mexican officials and the other was a British subject, the latter being inspected and passed. The Mexican officials were regular crossers, previously inspected. The total number of airplanes arriving was eight. With the exception of the three aliens previously mentioned all were American citizens returning to the United States after a few hours' visit to the Gulf of California and Sonoyta, Sonora, Mexico, on the international line.

Anacortes, Wash.—Acting Asst. Surg. S. G. Brooks in charge. Post-office and telegraphic address, Anacortes, Wash.

Anacortes is the terminus and home port of an international ferry connecting Victoria, British Columbia, with this port. Most of the persons passing through are of the tourist class, but there are a few aliens who are presented for examination. Of the 110 ships that entered this port carrying 1,561 seamen, about 25 per cent were of foreign registry. Of this number, 35 alien seamen were examined.

Blaine, Wash.—Acting Asst. Surg. M. A. Keyes in charge. Post-office and telegraphic address, Blaine, Wash.

The total number of aliens entering this port during the year was 272,356, of which 1,760 were aliens seeking permanent homes; 700 of this latter class were inspected. These persons arrive at this port from Canada by trains, auto stages, and by foot.

It is anticipated that the new customs-immigration building at this port will be completed in the near future and the facilities available for making the medical inspection of aliens will, as a result, be greatly improved.

Brownsville, Tex.—Surg. R. R. Tomlin in charge. Post-office and telegraphic address, Brownsville, Tex.

During the fiscal year there were 13,655 aliens medically examined for immigration purposes at this port. Every alien entering the United States through the port of Brownsville was examined at least once during the year. Of those aliens, 1,977 were bona fide immigrants, 63 were statistical aliens making temporary entry, and 11,615 were nonstatistical aliens, or local crossers. The aliens examined at this port, were, with a few exceptions, practically all of Mexican nationality. They are met by immigration officers as they cross the bridges from Mexico and are sent to the Public Health Service officers for medical examination.

The medical officer detailed for duty at the immigration station has also been designated to meet all airplanes arriving from foreign ports for the purpose of making the required inspections. During the year there were 807 airplanes from foreign countries, practically all coming from Central America and Mexico. These planes carried 1,967 crew and 1,508 passengers. Among the passengers and crew there were 1,161 aliens, all of whom were medically examined at least once during the year for immigration purposes; nine class B certificates and one class C certificate were issued. In addition to the regular mail planes arriving at this port, carrying a crew of one with an occasional passenger or two, the Pan American Airways have a plane which arrives daily from Mexico City and Tampico or Vera Cruz and Tampico. These planes have a crew of four and a carrying capacity of 10 passengers. They are met by a Public Health Service officer on arrival at the airport and the crew and passengers are examined for quarantine and immigration purposes. The general type of alien passengers entering by airplane is very high.

Buffalo, N. Y.—Acting Asst. Surg. W. L. Savage in charge. Post-office and telegraphic address, Buffalo, N. Y. Under the general supervision of Surg. Floyd C. Turner.

The total number of aliens entering the port during the year was 819,546, of which number 857 were examined medically. Of these aliens, 4,972 were bona fide immigrants seeking permanent homes, and 411 of this number were examined by the medical officer of the Public Health Service. Of the 1,614 aliens crossing the border at this point for temporary entry, 436 were referred for medical examination; likewise 10 nonstatistical aliens were referred for medical examination by the immigration authorities.

Due to the fact that most of the ships examined at this port are freighters and grain boats from Canada, there are very few alien passengers. Owing to the quota law, the examination of immigrants abroad, and the granting of visas for admission to the United States, the physical and mental condition of arriving aliens is of a much higher type than formerly. The medical officer examines all aliens held by the immigration authorities at the Peace Bridge and ferry which connect with Fort Erie across the Niagara River. Taken as a whole, the physical condition of these people is good. Arriving airplanes from Canada carry mostly first class passengers who are passed on primary inspection by the immigration inspector.

Calais, Me.—Acting Asst. Surg. S. R. Webber in charge. Post-office and telegraphic address, Calais, Me.

The majority of aliens seeking entry at this port were Canadians from the Maritime Provinces. They were, in general, in good medical condition. The medical examinations are conducted chiefly at the immigration station, the medical officer making routinely four daily calls at the immigration office for this purpose.

The total number of aliens entering at this port during the year was approximately 991,962; the number of bona fide immigrants making permanent entry was 655, of which number 552 were referred to the medical officer by the immigration authorities for examination.

Calexico, Calif.—Acting Asst. Surg. A. L. Rice in charge. Post-office and telegraphic address, Calexico, Calif.

The majority of aliens seeking entry at this port are Mexicans, with a few Canadians, Chinese, Japanese, and other nationalities. The medical examinations are made at the immigration office, the hours of duty for such work being from 9 a. m. to 1 p. m.; in addition, the medical officer is subject to call at any other hour of the day if necessary.

During the year 9,799 aliens were inspected, with 155 certifications for various causes. Of the number inspected, 364 were seeking permanent entry, 269 were making temporary entry, and 9,166 were "local crossers." Three hundred and fifty-eight vaccinations were performed.

Detroit, Mich.—Surg. J. H. Linson in charge. Post-office and telegraphic address, Detroit, Mich.

The new Detroit and Canada tunnel was opened for traffic on November 3, 1930. The Detroit terminal of this tunnel is about one block from the Detroit and Windsor Ferry Building, and the office assigned to the Public Health Service is on the second floor of this building. Medical inspection is held at the ferry building office from 9 to 10 a. m., and at the tunnel office from 10 to 11 a. m. Between the hours of 11 a. m. and 2 p. m. the officer engaged in the medical inspection of aliens makes sick calls at the Wayne County Jail, where an average of 150 prisoners are held by the Immigration Service. Outside calls for the medical inspection of aliens who are unable to report for examination or who are confined in various private hospitals are made during these hours. From 2 p. m. to 4.30 p. m. the officer is again on duty at the ferry building and at the tunnel.

Because of the lower rates on the ferry, the greater number of aliens enter by this route. During the last year more aliens of the working class have been seen by the examining medical officer, in contrast to the large number of tourists and visitors of the preceding year. These aliens come chiefly from northern and southern Europe, including the United Kingdom of Great Britain, with no particular country predominating. A total of 276,573 aliens entered this port during the year. Of this number 6,270 were classified as bona fide immigrants making permanent entry, 1,889 of whom were referred by the immigration authorities for medical examination. The number of aliens making temporary entry at this port totaled 3,303 while the number of "local crossers"

was 267,000; 3,213 of the former and 5,059 of the latter were medically examined.

Duluth, Minn.—Acting Asst. Surg. E. L. Cheney in charge. Post-office and telegraphic address, Duluth, Minn.

There has been a marked change in the number and type of aliens applying for admission at this port. During the past fiscal year, 38 passenger boats arrived, carrying 6,072 passengers. Only 13 alien passengers were admitted for permanent residence; 843 were making temporary entry. No certifications for disease were made. Of the 319 alien seamen examined, only 2 were certified.

Eastport, Me.—Acting Asst. Surg. J. E. Brooks in charge. Post-office and telegraphic address, Eastport, Me.

During the past year, 39,731 persons entered the United States through this port, 5,279 of whom made temporary entry for varying periods. Owing to the curtailment of the canning industries of fish and blueberries and the almost collapse of lumbering operations and pulpwood, immigration is almost at a standstill.

A part of the international ferry service for automobiles has been in operation for some time. The connecting link between this city and the nearest Canadian island will soon be in operation. This line will lessen the distance between this port and St. John and Nova Scotia by about 50 miles and should deflect a large proportion of the through traffic now entering the United States by way of the international bridge at Calais.

Eastport, Idaho.—Acting Asst. Surg. S. H. Hodgson in charge. Post-office and telegraphic address, Eastport, Idaho.

Eastport is on the Canadian border, and transportation to this port is via one railroad and one highway. The great majority of aliens arrive by automobile and a large proportion of these are in transit to Vancouver, British Columbia. The bulk of the traffic is during the summer months, as very severe winters are encountered here.

The total number of aliens entering this port was 15,160, of which number 840 were seeking permanent homes. During the year the border patrol apprehended 53 warrant cases and all were examined and deported.

El Paso, Tex.—Acting Asst. Surg. Irving McNeil in charge. Post-office and telegraphic address, 321 Mills Building, El Paso, Tex.

During the past fiscal year the two new subports, Newman School and Fort Hancock, have been included under the general supervision of this station. These new subports, together with Guadalupe and Ysleta, spread the activities of the station over a distance of more than 60 miles. The medical officer makes regular routine weekly calls at the subports for the purpose of making the medical immigration examinations.

Besides Mexican immigration, which naturally constitutes the bulk of immigrants at this port, there is a small number of two other groups. One includes the better class of Europeans, mostly British subjects, either tourists or professional men residing in Mexico; the other consists of Asiatics, either orientals or from the Near East, the last named often maintaining residence in Mexico for two years or more with the object of eventually making a home in the United States. It is among this class that a considerable proportion of the trachoma cases reported is found. Another fruitful source of trachoma is found among a sect called Mennonites, of northern European origin, but who have colonized in Mexico after a long residence in Canada. These people frequently travel back and forth between the Mexican colony and the Canadian colony. Illegal entrants have been greatly reduced, not only by the vigilance of the border patrol, but because of the realization of the difficulty of finding employment in this country, due to the economic depression.

Transportation by airplane to this port from Mexico was first inaugurated during the past fiscal year. These planes soon reached a daily schedule, and that schedule has been maintained throughout the year. The passengers on these planes have been generally of the better class, American citizens predominating. The planes reaching El Paso usually come only from Torreon, 460 miles away, which is the center from which planes come from various points and go to various destinations, passengers from the City of Mexico changing planes there. The only scheduled stops between Torreon and El Paso are Parral, Chihuahua, and Juarez.

The total number of aliens arriving at quarantine during the year, not including "local crossers," was 14,687; 143 of this number arrived by plane and 2 were certified as having diseases or defects.

Fort Monroe, Va.—Medical Director J. W. Kerr in charge. Post-office and telegraphic address, Fort Monroe, Va.

During the fiscal year, 167 passengers and 13,838 seamen were inspected. A total of 32 seamen were certified as suffering from class A diseases and three were certified for class B diseases or disabilities affecting ability to earn a living. The bulk of these inspections were made at Fort Monroe in conjunction with the quarantine inspections aboard ship. In addition, 54 ships not subject to quarantine inspection were boarded at Fort Monroe for medical inspections under the immigration law.

Gloucester, Mass.—Acting Asst. Surg. E. B. Hallett in charge. Post-office and telegraphic address, 139 Main Street, Gloucester, Mass.

For the most part the medical inspection of aliens at this station consists of the examination of alien seamen, the majority of whom come from the British Provinces. There are also a considerable number who come from European ports in salt and coal ships. Upon the arrival at this port of a ship on which there are aliens, the medical officer is notified by the immigration inspector and immediately boards the ship and makes the medical immigration examination. During the fiscal year 162 alien seamen were inspected, 4 of whom were certified as having disease or defects.

Halifax, Nova Scotia.—Acting Asst. Surg. F. V. Woodbury in charge. Post-office and telegraphic address, Halifax, Nova Scotia.

During the year, 7,501 aliens of all classes applied for the privilege of entry at this port, 1,751 of these received medical examination. All bona fide immigrants, numbering 1,247, were examined. Of the aliens examined by the Public Health Service in European ports prior to embarkation and seeking entry through this port, none were found to be suffering from disease or defect requiring deportation.

The majority of immigration passing through this port originates in the Province of Nova Scotia and in northern Europe; the quality of immigration is excellent. There has been noted during the past year a much more rigid interpretation and application of the immigration laws.

Hidalgo, Tex.—Acting Asst. Surg. Andrew W. Para in charge. Post-office and telegraphic address, Hidalgo, Tex.

Immigration at this port is almost exclusively Mexican. During the year, 4,024 aliens were medically examined. Of this number, 424 were bona fide immigrants seeking homes and were required by the immigration authorities to undergo an intensive examination, 8 were making temporary entry, and 3,592 were "local crossers." The majority of aliens examined and making entry through this port were of the better class. Clandestine crossings have decreased approximately 25 per cent, due to a great extent to the activities of the border patrol forces.

Honolulu, Hawaii.—Medical Director S. B. Grubbs in charge. Post-office and telegraphic address, Honolulu, Hawaii.

The medical inspection of first and second class and of certain third-class aliens is made aboard vessels while at quarantine anchorage. All alien steerage passengers from oriental ports are examined at the immigration station. Foreign seamen are usually examined while vessels are at the quarantine anchorage or on the way to the wharf from the quarantine anchorage; some are given an intensive medical examination after the vessel has arrived at the wharf. The majority of aliens passing through this port were resident orientals who had been to China and Japan and were returning to their homes. There are practically no bona fide immigrants seeking permanent homes passing through this port. During the year 4,099 passengers were inspected. Of this number, 1,359 were given intensive examinations, and 180 were certified for disease or disability. A total of 28,130 seamen were inspected; 1,320 were given intensive examinations, and 44 were certified for disease or defect.

Jackman, Me.—Acting Asst. Surg. E. D. Humphreys in charge. Post-office and telegraphic address, Jackman, Me.

Immigration at this port consists for the most part of aliens arriving from Canada, both by highway and by rail. A majority of these persons are farmers, and other laboring classes who cross the border at this point for the purpose of making purchases or for temporary visits. The total number of aliens entering the port during the year was 93,934. Of this number, 183 were immigrants seeking permanent entry and 93,751 were nonstatistical aliens making temporary entry. Of the total number of aliens entering the port, 283 were referred to the medical officer by the immigration authorities for medical examination.

Jacksonville, Fla.—Acting Asst. Surg. R. S. Wynn in charge. Post-office and telegraphic address, Jacksonville, Fla.

Because of the fact that the foreign ships entering this port are, for the most part, cargo vessels, the immigration work consists almost exclusively of the examination of alien seamen. Two or three passenger vessels stopped at this port during the year en route to New York. There were 120 alien passengers disembarking at this port, out of which number 1 was certified for disease. Eight aliens were bona fide immigrants seeking permanent homes. The general type of these was well above the average class of immigrant, both as regards intelligence and physical condition. The number of alien seamen examined during the year totaled 2,578, of which number 4 were certified for disease or defect.

Key West, Fla.—Acting Asst. Surg. J. Y. Porter, jr., in charge. Post-office and telegraphic address, Key West, Fla.

During the year 5,825 alien passengers and 2,526 alien crew were inspected, a slight decrease as compared with the preceding year. The class of alien is, as a rule, high, the vast majority being tourists from Cuba, with a few from Mexico, Central and South America, and a very small number from Europe and Asia. The medical inspection of aliens is conducted in conjunction with the quarantine activities at this port; however, during the year 157 vessels were met and boarded solely for immigration medical inspection.

Lewiston, N. Y.—Acting Asst. Surg. R. H. Sherwood in charge. Post-office and telegraphic address, Lewiston, N. Y. Under the general supervision of Surg. Floyd C. Turner.

Aliens arrive at Lewiston from Toronto, Canada, via the Canadian ports of Niagara on the Lake and Queenstown about five months out of the year; very severe weather is encountered the remainder of the year. Most of these aliens are from England, Scotland, and Wales and they are, generally speaking, of a very high type. Medical immigration examinations are also available at the international bridge at Lewiston. During the year a total of 26,370 aliens entered through this port. Of this number, 25,835 were medically examined.

Malone, N. Y.—Acting Asst. Surg. P. F. Dalphin in charge. Post-office and telegraphic address, Malone, N. Y.

The total number of aliens applying for admission to the United States through the port of Malone during the fiscal year was 8,484, of which number 147 were accorded medical examination at the time of their arrival at this port; a majority of these aliens, however, had been preexamined in Canada upon the occasion of their applying for visa. In previous years a great percentage of the immigrants applying for admission to the United States at this port, especially during the summer months, were composed of Canadian nonresident laborers who heretofore had been in the habit of coming to the United States and doing seasonal work in the lumber woods. During April and May of the past year, over 90 per cent of the persons examined were this type of immigrant. Because of the economic depression in the United States and the labor conditions, these people were stopped at the border and turned back. Since that date this type of alien has almost ceased to apply for admission.

Mobile, Ala.—Passed Asst. Surg. R. E. Bodet in charge. Post-office and telegraphic address, Mobile, Ala.

The majority of alien passengers applying for admission at this port are from Central American countries and the West Indies or Cayman Islands, coming to the United States on short business or pleasure trips or to enroll as students in the various colleges in this country.

Aliens presenting evidence of class A diseases and requiring further observation or laboratory confirmation prior to certification are usually referred by the immigration authorities to the marine hospital in Mobile for such observation or additional examination and certification.

During the year, 4,951 aliens were medically examined at this station. Of these, 4,897 were alien seamen, 43 were alien passengers, and 11 were alien stowaways.

Naco, Ariz.—Acting Asst. Surg. B. C. Tarbell in charge. Post-office and telegraphic address, Naco, Ariz.

The aliens encountered at this port are mostly of Mexican race and nationality, being of the laboring class and entering for business, pleasure, and in transit. Aliens held for deportation proceedings are also accorded medical examination at this port. The majority of alien passengers arrive at this port by automobile; there is a daily stage service between Cananea, Agua Prieta and Naco, Sonora, Mexico. A small number also come from Cananea and Nogales,

Sonora, Mexico, tri-weekly train service being maintained between these places and Naco, Sonora, Mexico. During the year an average of approximately 16,650 automobiles entered the United States monthly through this port. Inspection is maintained for 24 hours each day, but only United States citizens and aliens previously lawfully admitted are allowed to enter the port from 5 p. m. to 9 a. m.

Approximately 542,108 aliens entered the United States at this port during the year. Forty-two of this number were recorded as statistical arrivals and a total of 3,801 were given medical examination. A total of 219 certifications were made.

Economic conditions in the United States are responsible for the curtailment of immigration for permanent residence, but the number of aliens entering for temporary stay and for local crossing remains about the same. The serious depression in the copper mines, Arizona's principal industry, has removed the incentive which brings many aliens to the United States unlawfully and as a consequence the work of the immigration border patrol has shown less results than in previous years.

New Bedford, Mass.—Acting Asst. Surg. E. F. Cody in charge. Post-office and telegraphic address, New Bedford, Mass.

The amount of work performed at this port during the year was very small, but 62 passengers and 117 seamen being inspected during this period. The arrivals at this port are Cape Verdeans returning under temporary permits from their native homes in the islands. The Cape Verdean is a good sanitary type, the majority of those entering having lived in this country for years under good surroundings.

New Orleans, La.—Surg. T. J. Liddell in charge. Post-office and telegraphic address, Room 305 Customhouse, New Orleans, La.

The conduct of the medical examination of aliens at this port is performed in conjunction with quarantine inspection. Any alien requiring further examination or treatment is sent by the local immigration authorities either to the immigration station at Algiers, La., or to the marine hospital, New Orleans; aliens requiring intensive treatment are sent to the local United States marine hospital. During the year there were 3,658 alien passengers examined upon arrival who had not been examined abroad, and 4 who had been previously examined abroad prior to embarkation. Out of this number, 3,640 were passed and 22 certified for mental or physical defects. Practically 75 per cent of the passengers arriving at this port are first class and come from Central and South American countries.

In addition to the medical examination of alien passengers, the medical officer in charge also examines alien crews on vessels arriving at this port. During the year, 37,153 alien seamen were examined for immigration purposes at this port, of which number 316 were certified for disease or defect.

Niagara Falls, N. Y.—Acting Asst. Surg. Raymond Hensel in charge. Post-office and telegraphic address, Niagara Falls, N. Y.

Entry at this port is made via two vehicular and passenger bridges and two railroad bridges. Medical examinations are conducted either at the bridges or at the main immigration office, which is located near the railroad station.

During the year there has been a decrease in the number of statistical aliens admitted at this port. Most of the statistical aliens arriving are relatives of legally admitted aliens or aliens who had been here illegally and were apprehended, and were not attempting to make legal entry. There has been a marked increase in the number of illegal entries apprehended in this area during the past year. It is necessary to examine medically these aliens and to furnish medical treatment to any who might be in need of attention.

The total number of aliens applying for entry was 1,529,205, of which 5,571 were statistical aliens. Of this number, 1,845 were medically examined and 110 certified for physical or mental defects.

Nogales, Ariz.—Medical Director D. Moore in charge. Post-office and telegraphic address, Nogales, Ariz.

The majority of aliens entering this port are Mexicans, with occasional Europeans, Canadians, and Asiatics. In addition to the medical examination of immigrants applying for admission at this port, the medical officer visits, as occasion demands, the substation at Lochiel, some 27 miles eastward, for the purpose of making medical examinations of aliens.

During the year, 22,398 aliens entered the United States through this port. Of these, 5,030 were classified as statistical aliens making permanent entry.

5,860 were aliens making temporary visits, and 11,508 were "local crossers."

Noyes, Minn.—Acting Asst. Surg. George R. Waldren in charge. Post-office and telegraphic address, Noyes, Minn.

The past year has seen a slight decrease in the number of aliens applying for admission through the port of Noyes. This is largely due to the wave of depression and the economical condition of the Prairie Provinces of Canada, and especially the Province of Manitoba. Also, where at one time all automobile traffic was routed via one highway, now an additional highway has been built, diverting part of this class of travel to another port. A great part of the aliens who are referred to the medical officer at this port by the immigration authorities for medical examination are those seeking medical treatment in this country; only a very small proportion of the aliens coming over for temporary entry are referred for medical examination. The majority of statistical aliens seeking permanent entry were examined at Winnipeg. The total number of aliens entering this port was 50,511, of which number 129 were examined medically.

Ogdensburg, N. Y.—Acting Asst. Surg. R. L. Stacy in charge. Post-office and telegraphic address, Ogdensburg, N. Y.

The great majority of aliens entering through the port of Ogdensburg were either farmers or laborers, coming chiefly from Canada, England, Ireland, and Scotland. These examinations are conducted either at the office of the medical officer or at the immigration office. Practically all the arriving foreign seamen were examined on shipboard. During the fiscal year, 166,680 aliens entered through this port. Of this number, 182 were bona fide immigrants seeking permanent homes; 640 were making temporary entry. One hundred and thirty-two of the former and 11 of the latter were given a medical examination.

Pensacola, Fla.—Acting Asst. Surg. C. W. d'Alemberte in charge. Post-office and telegraphic address, Pensacola, Fla.

Immigration operations at this station consist for the most part of the examination of alien seamen, there being very little alien passenger traffic encountered here. The type of immigrant seamen encountered varies greatly in view of the fact that vessels of nearly all nationalities call here. During the fiscal year there were examined 1,204 alien seamen and 8 workaways. Of this number, only four were certified as being afflicted with disease or defect.

Philippine Islands.—Surg. R. W. Hart in charge. Post-office and telegraphic address, P. O. Box 424, Customhouse, Manila, P. I.

The medical inspection of arriving aliens at ports in the Philippine Islands is performed by the quarantine officers in conjunction with their quarantine duties. The collectors of customs act as immigration officers and are charged with the enforcement of the laws and regulations concerning immigration. Provision is made at every port of entry in the islands for the medical inspection of arriving aliens.

A majority of aliens arriving at Philippine Island ports are Chinese from Fukien and Canton who embark at the ports of Amoy and Hong Kong. Most of these are returning resident aliens and minor children of resident aliens. A small percentage of aliens examined under the immigration laws are Japanese. The primary examination of arriving aliens is made on board incoming vessels, since there has been no provision made for conducting such examinations on shore. Those individuals found suffering from disease at the time of the primary examination are held for further detailed examination ashore, this being performed at the out-patient office of the Public Health Service in the customhouse. At present there are no facilities available for the hospitalization of diseased aliens who may require prolonged observation. However, construction of an immigration station at the port of Manila has begun and facilities will be provided there for the detention, observation, and treatment of aliens.

About 98 per cent of aliens arriving in the Philippine Islands enter through the port of Manila. The remaining 2 per cent enter through the ports of Davao, Jolo, and Zamboanga. As only freight vessels arrive at the ports of Cebu, Iloilo, Legaspi, Cavite, and Olongapo, practically no aliens are inspected at these ports. During the year a total of 23,986 aliens were examined. Of this number, 133 were certified in accordance with the immigration laws.

Port Huron, Mich.—Acting Asst. Surg. George M. Kesl in charge. Post-office and telegraphic address, Port Huron, Mich.

During the fiscal year ended June 30, 1931, 904,798 aliens entered the United States at Port Huron. Of these, 1,412 signified their intention of becoming permanent residents and 249 were referred for medical examination by immigration authorities. In addition, 810 aliens sought admission at this port for temporary visits, and there were 902,574 "local crossers"; 354 of the former and 353 of the latter were referred to the medical officer by the immigration authorities for medical examination.

While the number of aliens made the subject of a medical examination decreased in comparison with previous years, the percentage of those certified as suffering with defect or disease reveals an increase. This is due to a more intensive examination now being given arriving aliens. Examinations are conducted at the St. Clair Tunnel station if entry is made by railroad and at the wharf office of the Immigration Service in case of arrival by ferryboat. In addition, many aliens are brought by automobile to the out-patient dispensary of the Public Health Service in the Federal Building where better facilities enable a more satisfactory examination. The type of immigrant applying for admission at this port is excellent. Approximately 80 per cent are natives of Canada.

Porto Rico.—Surg. L. E. Hooper in charge. Post-office and telegraphic address, San Juan, P. R.

During the year 7,832 alien passengers and 21,580 alien seamen entered the ports of Porto Rico. Of this number, 7,772 passengers and 19,274 seamen were examined at San Juan and 60 passengers and 2,306 seamen at the nine subports.

The routine medical examination of aliens arriving in Porto Rico is effected aboard vessels in conjunction with the quarantine inspection. Suspicious or doubtful cases are sent to the Public Health Service office for further examination. The majority of immigrants arriving at Porto Rican ports come from the other islands of the West Indies or from Central or South America. A few come from European countries. The type is generally good, many of them traveling first class.

Presidio, Tex.—Acting Asst. Surg. C. M. Hatcher in charge. Post-office and telegraphic address, Presidio, Tex.

The general type of immigrant examined at this station is of the laboring class; practically all are Mexicans and are very poor. Most of the immigrants locate on near-by farms. During the year 21,304 aliens entered the United States through this port. Of this number, 11 were bona fide immigrants making permanent entry and 13 were making temporary entry; the remainder were nonstatistical aliens or "local crossers."

Providence, R. I.—Surg. H. G. Ebert in charge. Post-office and telegraphic address, 403 Federal Building, Providence, R. I.

Alien passengers seeking entrance into the United States through the port of Providence originate almost entirely in the countries bordering on the Mediterranean and Black Seas, and from Portugal and its island possessions, Madeira and the Azores. From a standpoint of personal cleanliness and freedom from major personal defects, it would appear that closer attention is being paid to those applying for passage than was noted in previous years.

During the year 1,958 alien passengers were examined who had not been given a previous medical examination abroad prior to embarking. Of this number, 50 were certified under class B and 3 under class C diseases. Of the 93 aliens who had been examined abroad prior to embarkation, 19 had been certified under class B and 1 under class C. These were again inspected at this port and their condition noted on the medical certificates.

The total number of alien crews examined during the year was 5,344, of which 1,458 were intensively examined. No disease or defect was noted among these men.

Rio Grande, Tex.—Acting Asst. Surg. C. J. Martin in charge. Post-office and telegraphic address, Rio Grande, Tex.

During the last fiscal year there were 912 aliens medically examined for immigration purposes at this port. Of this number, 5 were bona fide immigrants seeking permanent homes, 1 was making temporary entry, and 906 were "local crossers" coming for business and trade purposes. The port is open from 8.30 a. m. to 4.30 p. m., and medical examinations are conducted during those hours. The aliens examined are practically all of the Mexican race and belong to the laboring classes. Clandestine crossing is decreasing somewhat, due to the activities of the border patrol.

St. Albans, Vt.—Acting Asst. Surg. G. C. Berkley in charge. Post-office and telegraphic address, St. Albans, Vt.

The general type of immigrant passing through this port belongs to the French Canadian class. Many aliens of this class with criminal records are apprehended here and are detained in the county jail. At the request of the immigration authorities these aliens are given a medical examination by the medical officer in charge. The facilities at this port where medical examinations are performed are very meager, but it is anticipated that a new Federal building will be constructed in the future with much improved facilities for this purpose.

The total number of aliens passing through this port during the year was 30,298. Those seeking permanent homes totaled 716, of which number 67 were required to undergo a medical examination; 1,341 made temporary entry, and of this number 75 were referred for medical examination; 28,241 were non-statistical aliens or "local crossers."

St. John, New Brunswick.—Acting Asst. Surg. D. C. Malcolm in charge. Post-office and telegraphic address, St. John, New Brunswick, Canada.

From December until April, 202 aliens were inspected at this port, these landing from 21 Canadian-Pacific steamships. British subjects predominated with a scattering of Hebrews, Germans, Poles, Slavs, and Scandinavians. The port of St. John is open all the year but most of its operations are carried on in the winter months, during which months the ports of Montreal and Quebec are icebound.

San Diego, Calif.—Surg. J. W. Tappen in charge. Post-office address, Point Loma, Calif.; telegraphic address, San Diego, Calif.

The greater part of the medical immigration examinations at this port is done aboard arriving vessels at Point Loma, in conjunction with quarantine inspection. The majority of alien passengers arriving are of an exceptionally good type, largely tourists from the east coast, as the vessels are, for the most part, intercoastal from New York City, with ports of call in the West Indies and the Canal Zone. Some few ships arrive also from Sweden, France, and England. The type of alien of these vessels are also of the better class. During the year a total of 983 alien passengers were inspected at this port, together with 6,765 alien crew. The latter is composed almost entirely of the crews of small fishing vessels, Portuguese and Italians, unnaturalized residents of San Diego, who pursue their occupation of fishermen in southern waters off the coast of Mexico. There were no certifications among them.

The medical officer at San Diego also performs the medical immigration examinations of aliens arriving at the port of San Ysidro, which is located at the extreme southwestern corner of the United States. This is the principal port of entry from the large territory of Baja California, Mexico, and is rapidly assuming a position of consequence in interrepublic travel. The climate and fertile soil of the neighboring country is attracting thousands to settle there permanently. Motor traffic through this port is composed mostly of returning United States citizens, but the daily crowded procession of foot passengers is largely alien. During the year, 542,597 aliens crossed the border at this point; of these, 11,690 were medically examined.

San Francisco, Calif.—Surg. H. A. Spencer in charge. Post-office and telegraphic address, San Francisco, Calif.

The activities of the Public Health Service at this station may be described under the following headings: (1) Examination on ship board, (2) station examinations, (3) hospital, and (4) miscellaneous.

A total of 8,089 alien passengers were medically examined on ship board upon arrival, of whom 2,157 were bona fide immigrants. The remainder, consisting principally of first cabin, second cabin, and returning alien passengers, were passed on inspection aboard ship. Any suspected of suffering from physical or mental ailments or diseases are referred to the immigration station for further medical examination. Of the total number of aliens arriving at this port and undergoing medical examination, 1,231 were referred to the station for a further examination. The hospital is utilized for the detention of aliens for observation; for the treatment of aliens; for the isolation of those suffering from communicable diseases, etc. This hospital has a normal capacity of 60 beds, which may, in emergency, be increased to 80.

All orientals and others who have resided in the Orient for a considerable period are subjected to a stool examination upon arrival at San Francisco. Uncinariasis is the most important condition usually found. Of 1,318 stool

examinations, 215 were found positive for hookworm, or approximately 16 per cent. Applicant aliens certified for uncinariasis come to the hospital for treatment before being released. Since the fiscal year 1929, the number of hookworm certificates issued have decreased from 256 to 99.

Passenger vessels, with rare exceptions, call at Honolulu previous to arrival at San Francisco, and the medical examination of the crews on these vessels is conducted at that port. During the year only 54 seamen were inspected at this station for immigration purposes.

San Pedro, Calif.—Surg. H. E. Trimble in charge. Post-office and telegraphic address, 111 West Seventh Street, San Pedro, Calif.

Immigration medical inspections at the port of Los Angeles is combined with the quarantine and medical relief work; the majority are made in conjunction with the quarantine inspection made by the quarantine boarding officer.

The majority of alien passengers arriving at this port and seeking permanent entry were from the Orient (mainly from Japan), Mexico, South and Central America, Norway, and Sweden, in the order named. A total of 50,381 alien seamen and 7,463 alien passengers were examined during the year. Of this number 118 were certified for disease or defect.

Sasabe, Ariz.—Acting Asst. Surg. John M. Hardy in charge. Post-office and telegraphic address, Sasabe, Ariz.

During the past year there has been a decrease in all classes of alien arrivals. A total of approximately 3,000 aliens entered the port during the year; 431 of these were medically examined. Of the latter, 6 were statistical aliens making permanent entry; 3 statistical aliens making temporary entry; and 422 were nonstatistical aliens crossing the border as "local crossers," for temporary admission or as transits.

The general class of aliens admitted through the port were Mexicans of the better class, constituting merchants, ranchers, miners, and government officials entering to make purchases in the United States. The hours for conducting medical inspections are from 9 a. m. to 5 p. m.

Sumas, Wash.—Acting Asst. Surg. E. S. Clark in charge. Post-office and telegraphic address, Sumas, Wash.

While most of the aliens come direct from Canada, some arrive via Canada from other countries. These entries comprise all known occupations—farmers, laborers, skilled and unskilled mechanics, professional classes, and similar occupations. In addition, the medical officer is often called to make medical examinations of aliens who have gained a surreptitious entry into the United States and are apprehended by the border patrol. During the year, 212,489 aliens entered the United States through this port; 198 of these were bona fide immigrants seeking permanent homes.

Vanceboro, Me.—Acting Asst. Surg. Roy M. MacLean in charge. Post-office and telegraphic address, Vanceboro, Me.

The greater part of immigration at this port is comprised of aliens from Canada, conforming to the ordinary type of Canadians. There are, however, a few from overseas countries, which are given a careful examination by the medical officer in charge. Any aliens requiring examination are presented by the immigration authorities at the immigration station, careful attention being given to the hair, eyes, nose, throat, glands, heart, and examination for deformities and any other physical irregularities. Suspicious cases are held for more thorough examination. During the year the total number of aliens entering the United States at this point was 55,698, of which number 1,531 were referred for medical examination.

Winnipeg, Manitoba, Canada.—Acting Asst. Surg. George B. Story in charge. Post-office and telegraphic address, Winnipeg, Manitoba, Canada.

During the year, 13,238 persons applied for admission to the United States through the port of Winnipeg, of whom 3,534 were referred for medical examination. The number of statistical aliens who were found to be admissible at this port as bona fide immigrants seeking homes was 1,213; the number of statistical aliens found admissible for temporary entry during the year was 2,175; the number of nonstatistical aliens who applied for permission to cross the border was 9,280. Of the 3,534 applicants for admission who were referred for medical examination, 817 were found to be afflicted with disease or defects. Among the number certified, 518 were going to the United States for the relief of medical or surgical conditions. Of the statistical immigrants in possession of visas who presented themselves for entry into the United States at this port,

none who had previously been examined by a Public Health Service medical officer at a foreign port was found to differ physically or mentally from the condition expressed in the opinion of the surgeon making the original examination.

Compared with previous years, there has been a decided improvement in the type of immigrants seeking to enter the United States for the purpose of establishing permanent homes. Applicants from Central Europe, a group which in former years constituted a considerable percentage of the total number of immigrants, have practically disappeared. During the past year there has been a marked decrease in the number of all classes of immigrants seeking admission to the United States through the port of Winnipeg, which may be accounted for in part by the strict application of the immigration laws by the Department of State and also by conditions resulting from the economic depression.

DIVISION OF SANITARY REPORTS AND STATISTICS

In charge of Asst. Surg. Gen. R. C. WILLIAMS

The work of the division during the fiscal year consisted of (1) the collection, tabulation, analysis, and publication of current (weekly), monthly, and annual morbidity and mortality data, with special reference to the communicable diseases; (2) the compilation and publication of laws, regulations, and ordinances relating to public health; (3) the issuing of the weekly Public Health Reports, reprints, and supplements; (4) the distribution of Public Health Service publications; (5) the preparation of official news releases and broadcasts; (6) correspondence in response to requests for public health information which can not be answered by printed material; and (7) the notification of foreign governments of the appearance of quarantinable diseases in the United States and its possessions, and the exchange of sanitary information.

Reports of the prevalence of diseases dangerous to the public health were received throughout the fiscal year by telegraph and mail from all parts of the United States and from foreign countries. These reports came from State and local health officers, officers of the Public Health Service, American consuls, foreign governments, the health section of the Secretariat of the League of Nations, the International Office of Public Hygiene at Paris, the Pan American Sanitary Bureau, and other sources.

The obligations imposed upon our Government by international sanitary conventions to notify foreign governments of the appearance of quarantinable diseases, and of the prevalence of certain communicable diseases, were met during the fiscal year.

The telegraphic reports received weekly from State health officers with regard to certain communicable diseases were summarized, and mimeographed copies were sent to the State health officers. In this way early notice is given of the prevalence of diseases which health officers are eager to guard against.

MORBIDITY AND MORTALITY REPORTS

Without adequate reporting of the notifiable diseases, public health authorities can not effectively prevent or control disease. For several years efforts have been made to establish a morbidity reporting area, similar in manner of determination to the registration areas for births and deaths established by the Bureau of the Census. The purpose of such an area is to secure more nearly complete and, in general, better reporting of communicable diseases. During the fiscal year this division formulated a plan for the establishment of a morbidity reporting area. This plan was presented at the Conference of State and Territorial Health Officers which met in Washington, D. C., in April, 1931, and received the unanimous approval of the conference. The plan is based on facilities of the health de-

partments for collecting reports of cases of notifiable diseases and on the case fatality rates for certain diseases over a period of several years. The basic requirements, in addition to achieving the required case fatality rates, were:

1. Inclusion in the registration area for deaths and births.
2. Adequate legislation to enforce reporting.
3. Machinery for securing reports and keeping records.
4. Sufficient clerical force to do the work required.
5. A willingness to cooperate in efforts to secure more adequate records of morbidity.

An analysis of the morbidity reports received from the various State health departments and tabulated in the division was made the basis of the case fatality rates. The diseases used were diphtheria, measles, scarlet fever, typhoid fever, and whooping cough. The average fatality rate for each disease was computed for the entire death registration area. States showing a general average of more than 100 per cent—that is, having better reporting than the average, as indicated by the fatality rates—were graded as “standard,” while those States falling below the average were classed as “below standard.” It was encouraging to note that 24 States were above the average number of cases reported for each death. Twenty-one States were below the average, while for four States the data were incomplete.

The computations were made on the numbers of cases and deaths for each disease as reported to the Public Health Service, but the figures for States which were near the dividing line were corrected by using the deaths as published by the Bureau of the Census.

The average number of cases for each death for the three years was as follows:

	Cases
Diphtheria.....	11
Measles.....	106
Scarlet fever.....	78
Typhoid fever.....	5
Whooping cough.....	26

The plan as outlined is by no means considered final or perfect, but it establishes a definite basis for constructive criticism and future development. It appears for the present to be the most practicable plan that can be put into effect, and it is hoped that further development will stimulate health officers and physicians to cooperate in promptly submitting reports of notifiable diseases. It is believed that with some effort practically all States can soon reach the required standard, be admitted into the morbidity reporting area, and thus aid in achieving better reporting. Of course the Public Health Service must do its part as a central agency in the collection, tabulation, compilation, and distribution of the morbidity information; and the degree of effort, cooperation, and encouragement in the work of the Public Health Service will depend on specific appropriation made for it by the Congress.

CURRENT PREVALENCE OF COMMUNICABLE DISEASES

Reports of the current prevalence of communicable diseases in the United States, received from State and local health officers, and reports of quarantinable and other diseases, received from various

sources, were promptly compiled and summaries of the data were published currently in Public Health Reports. The current reports for the United States consisted of (1) weekly telegraphic reports received from the State health officers, and (2) weekly reports received by post card from cities of 10,000 or more population. In addition to publishing these current data each week as received, every month a 4-week summary has been published. For statistical reasons these summaries are for 4-week periods rather than for the calendar month. These current summaries are valuable in that they give a good cross-section picture of conditions throughout the country with regard to the incidence and geographic prevalence of the important communicable diseases. When outbreaks of unusual incidence of any of the diseases are occurring, these summaries are extended to cover periods preceding the increased incidence, and comparisons are given by geographic areas with the occurrence during prior years. These summaries, therefore, present briefly a survey of conditions throughout the country, with regard to the communicable diseases that are especially important from the health officers' standpoint, information regarding localities where special control measures are needed, and the results of efforts to prevent the spread of disease.

CURRENT STATE MORTALITY STATISTICS

The publication in Public Health Reports of monthly mortality statistics from the States that could furnish the data to the Public Health Service was continued throughout the year. The present plan is to publish about three such summaries during the year, including, for those States which supplied the most recent information, the periods January to March, January to June, and January to September, and later an entire summary for the whole year. The rates are cumulative year-to-date rates, computed on an annual basis; that is, they are rates that would obtain for the entire year if mortality conditions should remain the same for the remainder of the year. Each summary includes not only data for the specific period of the current calendar year, but also comparative rates for the corresponding periods of four preceding years. The death rates are given by States and by causes. The purpose of publishing this information is to make currently available to the various health authorities, and to other persons interested, mortality data from as many States as possible and at as early a date as possible. As these rates are computed from preliminary reports, it is not expected that they shall be considered as final or that they will agree with the rates published later by the Public Health Service or those issued by the Bureau of the Census. They are intended to, and do, serve only as a current index of mortality until final figures are issued by the Bureau of the Census.

COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS

The appointment of officers of State and local health departments as officers of the Public Health Service to aid in securing reports of outbreaks and current prevalence of diseases dangerous to the public

health was continued during the fiscal year. These appointments are made at the nominal salary of \$1 per annum, and they aid materially in the collection of morbidity information and in the improvement in reporting throughout the United States.

The accompanying table shows the States in which these officers were acting at the close of the fiscal year and the number of officers in each State.

Collaborating and assistant collaborating epidemiologists as of June 30, 1931

State or possession	Collaborating epidemiologists	Assistant collaborating epidemiologists	State or possession	Collaborating epidemiologists	Assistant collaborating epidemiologists
Alabama.....	1	54	Nebraska.....	1	95
Arizona.....	1	69	New Jersey.....	1	0
Arkansas.....	1	213	New Mexico.....	1	28
California.....	1	238	New York.....	0	1
Colorado.....	1	197	North Carolina.....	1	100
Connecticut.....	1	0	North Dakota.....	1	88
Delaware.....	1	3	Ohio.....	1	161
Florida.....	1	11	Oklahoma.....	1	81
Georgia.....	1	42	Oregon.....	1	102
Idaho.....	1	9	Porto Rico.....	1	3
Illinois.....	1	108	South Carolina.....	1	14
Indiana.....	1	571	South Dakota.....	1	63
Iowa.....	1	314	Tennessee.....	1	41
Kansas.....	1	116	Texas.....	1	305
Kentucky.....	1	129	Utah.....	1	41
Louisiana.....	1	45	Vermont.....	1	10
Maine.....	1	488	Virginia.....	1	33
Maryland.....	1	75	Washington.....	1	55
Massachusetts.....	1	0	West Virginia.....	1	76
Michigan.....	1	17	Wisconsin.....	1	236
Minnesota.....	1	1	Wyoming.....	1	33
Mississippi.....	1	77			
Missouri.....	1	122	Total.....	44	4,559
Montana.....	1	94			

TELEGRAPHIC REPORTS

It is important that the Public Health Service and the State health officers receive prompt information regarding the occurrence or outbreaks of communicable diseases dangerous to the public health. Early knowledge of such outbreaks and of their geographic occurrence and movement permits of prompt preventive measures on the part of health officers; and prompt action before a communicable disease has spread often prevents serious results.

Telegraphic reports of such outbreaks and of general occurrence of certain important notifiable diseases in the United States are received by this division from officers of the Public Health Service, from collaborating and assistant collaborating epidemiologists, and from State and local health officers. These reports are promptly compiled, are summarized and sent to health officers in mimeographed form, and are published in full in Public Health Reports.

Since 1918 regular weekly telegraphic reports of the prevalence of the principal communicable diseases have been received from State health officers. In 1919 this telegraphic information was received from only 24 States, in 1924 from 37 States, and in 1931 it was received from 47 States, Nevada being the only State unable to supply these reports.

MONTHLY STATE REPORTS

Monthly reports of the number of cases of notifiable diseases were received during the fiscal year from the District of Columbia, Porto Rico, Hawaii, and all States except Kentucky and Utah. These monthly reports include more diseases than do the weekly telegraphic reports, and they include cases which were reported to the State health departments too late for inclusion in the weekly telegrams. The following-named diseases are included in the monthly reports from most of the States when such diseases are actually reported as occurring within the State.

Anthrax in man.	Poliomyelitis.
Chicken pox.	Rabies in animals.
Cholera.	Rabies in man (developed cases).
Dengue.	Rocky Mountain spotted or tick fever.
Diphtheria.	Scarlet fever.
Dysentery.	Septic sore throat.
Influenza.	Smallpox.
Leprosy.	Tuberculosis (pulmonary).
Lethargic encephalitis.	Tuberculosis (all forms).
Malaria.	Tularaemia.
Measles.	Typhoid fever.
Meningococcus meningitis.	Typhus fever.
Mumps.	Undulant fever.
Occupational diseases and disabilities.	Whooping cough.
Paratyphoid fever.	Yellow fever.
Pellagra.	Other diseases not notifiable in the
Plague.	State, but reported.
Pneumonia (all forms).	

Some of the States can not give information for all of the diseases listed, and some of them include reports of cases of diseases not given in the list.

ANNUAL STATE MORBIDITY REPORTS

Annual volumes presenting the compiled reports of the notifiable diseases in States have been published each year since 1912. These annual summaries have greatly improved in scope since the first issue, especially with respect to the number of diseases, the number of States, and the presentation of the information. The volume of 1930, prepared during the fiscal year, includes data from all of the States, the District of Columbia, the Territory of Hawaii, the Philippine Islands, and Porto Rico.

WEEKLY AND ANNUAL CITY REPORTS

Weekly reports of the number of cases of the principal communicable diseases and deaths therefrom were received during the year from 575 cities having a population of 10,000 or over. For the purpose of providing a current comparable index to the prevalence of certain communicable diseases in cities and, to a certain extent, in various geographic sections of the country, the weekly reports from approximately 100 of these cities scattered throughout the country were tabulated by geographic areas, case and death rates were computed, and these rates for 5-week periods were published together with the corresponding rates for the preceding year. For some of the diseases the estimated expectancy, based on reports from each

city for the preceding nine years, was computed. These rates were published currently in Public Health Reports.

Two annual summaries of the prevalence of notifiable diseases in cities in 1930 were prepared for publication; one was for cities of over 100,000 population and one for cities having from 10,000 to 100,000 population.

INSANE, FEEBLE-MINDED, AND EPILEPTICS

Monthly reports of new admissions to hospitals for the care and treatment of the insane were received during the fiscal year. The data include admissions by sex and diagnosis, the number of patients in hospitals at the end of each month, and the number of patients on parole.

Reports were also received monthly from hospitals for the care of feeble-minded and epileptics. These reports show the number of patients on the rolls of the institution, the number in hospital and on parole, and the number of admissions, discharges, and deaths.

Owing to the lack of personnel available to tabulate and compile the data received, the compilation and publishing of this information currently has been temporarily suspended.

FOREIGN REPORTS

In the collection of reports from foreign countries regarding the prevalence of quarantinable diseases and other diseases dangerous to the public health, this division received during the fiscal year reports from officers of the Public Health Service stationed abroad, from American consular officers, from foreign governments, from the International Office of Public Hygiene, from the Pan American Sanitary Bureau, and from the health section of the League of Nations. These reports were compiled, abstracted, or tabulated, and published in the weekly Public Health Reports for the information of Federal, State, and local health officers and others interested. The figures published currently are not represented as being final or complete, either with reference to countries represented in the data or to the actual figures themselves. The purpose is rather to show as far as possible the localities of recent occurrence, especially of the quarantinable diseases and of other diseases dangerous to the public health, where the information is available.

INTERNATIONAL EXCHANGE OF SANITARY INFORMATION

In accordance with the international sanitary convention of June 21, 1926, telegraphic information of the first cases of quarantinable diseases in ports of the United States and of the insular possessions has been given promptly by the Public Health Service, through this division, to the International Office of Public Hygiene at Paris and also to representatives of the countries signatory to the convention, through the Department of State.

During the fiscal year there was a constant interchange of information relative to the prevalence of disease, both in the United States and throughout the world, with the international health agen-

cies—the International Office of Public Hygiene, the Pan American Sanitary Bureau, and the health section of the League of Nations. In addition to the interchange of current information by cable and correspondence, the weekly Public Health Reports are mailed promptly to these three international health organizations, and in turn similar epidemiological publications are received promptly from them.

Regular weekly reports of the prevalence of communicable diseases were received from the Dominion of Canada during the fiscal year, prepared and sent out by the Department of Pensions and National Health of Canada. These reports were published currently in Public Health Reports. In return that department was kept currently informed as to conditions in the United States.

The development in recent years of current international interchange of information regarding the prevalence of disease has been an important contribution to the advance in international health relations, and has had a salutary effect in stimulating better reporting within the various countries and in encouraging a sense of national responsibility in the matter of prompt notification of the occurrence of quarantinable and other dangerous communicable diseases. With modern developments in modes and rapidity of transportation, the value of and necessity for prompt knowledge of health conditions in other countries is at once evident when one realizes that the time of transit by airplane from many of these countries to the United States is much shorter than the incubation period of most of the infectious communicable diseases.

PREVALENCE OF COMMUNICABLE DISEASES DURING CALENDAR YEAR 1930

Reports of the prevalence of communicable diseases received by the division from State health officers indicate that the health record for the United States for the calendar year 1930 was exceptionally good. The record for the first half of the year 1931 was also generally good, although an epidemic of mild influenza during the early months of 1931 increased the death rates for a time and gave the year a bad start from the health standpoint. Subsequent lower death rates, however, indicated that the cumulative death rate was being reduced as the year advanced.

With regard to the quarantinable diseases, there were no cases of cholera, plague, or yellow fever in the United States during the fiscal year, although there was an outbreak of cholera in the Philippine Islands which began in May, 1930, and continued throughout the fiscal year, and six plague-infected ground squirrels were reported from Monterey County, Calif., during the first six months of 1931, and the presence of plague-infected rats was reported from the Hamakua District in the island of Hawaii. Over 500 cases of endemic typhus fever and more than 48,000 cases of smallpox were reported in the United States during the calendar year 1930.

Although the outbreak of cholera in the Philippine Islands continued throughout the fiscal year, the numbers of cases and deaths during May and June, 1931, were comparatively small. During the calendar year 1930, about 4,600 cases of cholera with about 2,700 deaths were reported in the Philippines.

Cholera was more prevalent generally during the calendar year 1930 than it was in 1929, although the disease was not reported outside of Asia and the adjacent islands. In India more than 360,000 cases were reported in 1930, as compared with 285,000 in 1929.

Plague was as widespread throughout the world in 1930 as it has been in recent years, although the total number of reported cases was smaller than in 1929.

Yellow fever was reported from Brazil, in South America, and from the Gold Coast and British Cameroons, in Africa. One case was reported at Lagos, Nigeria, which was said to have been a laboratory infection.

The world prevalence of typhus fever has been decreasing since the decline of the great epidemic which followed the World War. The disease is still reported, however, from all the grand divisions of the world, the largest number of cases being reported by the Union of Soviet Socialist Republics.

Smallpox was reported from most of the countries of the world in 1930, although the number of cases in the countries of western Europe was comparatively small. In 1930 England and Wales reported more cases of smallpox than did all the countries of continental Europe, and the United States reported more cases than any other country with the single exception of British India.

COMMUNICABLE DISEASES IN THE UNITED STATES

The accompanying table gives a comparison of the number of cases of the principal communicable diseases and deaths from these diseases in the United States for the calendar years 1928, 1929, and 1930.

CASES

Disease	Number of States ¹	Aggregate population (in thousands)			Cases			Cases per 100,000 population		
		1928	1929	1930	1928	1929	1930	1928	1929	1930
Chicken pox.....	43	115,497	117,118	118,738	195,441	201,694	215,133	169.2	172.2	181.2
Diphtheria.....	44	117,469	119,112	120,753	90,169	84,273	65,422	76.8	70.8	54.2
Influenza.....	44	117,469	119,112	120,753	-----	-----	-----	-----	-----	-----
Malaria.....	44	117,469	119,112	120,753	-----	-----	-----	-----	-----	-----
Measles.....	44	117,469	119,112	120,753	553,998	362,298	394,884	471.6	304.2	327.0
Meningococcus meningitis.....	40	111,086	112,693	114,298	5,252	9,584	7,747	4.7	8.5	6.8
Mumps.....	38	101,442	102,857	104,273	126,352	95,463	113,005	124.6	92.8	108.4
Pellagra.....	44	117,469	119,112	120,753	-----	-----	-----	-----	-----	-----
Pneumonia (all forms).....	43	113,287	114,891	116,494	-----	-----	-----	-----	-----	-----
Poliomyelitis.....	35	97,652	99,020	100,389	4,772	2,742	8,185	4.9	2.8	8.2
Scarlet fever.....	44	117,469	119,112	120,753	170,423	179,055	170,940	145.1	150.3	141.6
Smallpox.....	44	117,469	119,112	120,753	37,961	40,706	48,033	32.3	34.2	39.8
Tuberculosis (all forms).....	43	117,051	118,684	120,315	-----	-----	-----	-----	-----	-----
Tuberculosis (respiratory system).....	36	105,033	106,556	108,078	-----	-----	-----	-----	-----	-----
Typhoid fever.....	44	117,469	119,112	120,753	26,636	22,646	26,558	22.7	19.0	22.0
Whooping cough.....	44	117,469	119,112	120,753	156,844	192,556	157,540	133.5	161.7	130.5

¹ In addition to the number of States given, the District of Columbia is also included.

DEATHS

Disease	Deaths			Deaths per 100,000 population			Cases reported for each death registered		
	1928	1929	1930	1928	1929	1930	1928	1929	1930
Chicken pox.....	130	147	118	0.1	0.1	0.1	1,503	1,372	1,823
Diphtheria.....	8,401	7,832	5,904	7.2	6.6	4.9	11	11	11
Influenza.....	49,419	65,012	22,596	42.1	54.6	18.7	-----	-----	-----
Malaria.....	4,291	4,133	3,422	3.7	3.5	2.8	-----	-----	-----
Measles.....	5,535	2,809	3,358	4.7	2.4	2.8	100	129	118
Meningococcus meningitis.....	2,306	4,359	3,414	2.1	3.9	3.0	2	2	2
Mumps.....	77	96	69	.1	.1	.1	1,641	994	1,638
Pellagra.....	7,502	7,367	7,086	6.4	6.2	5.9	-----	-----	-----
Pneumonia (all forms).....	114,514	108,485	96,861	101.1	94.4	83.1	-----	-----	-----
Poliomyelitis.....	1,165	679	1,092	1.2	.7	1.1	4	4	7
Scarlet fever.....	2,135	2,447	2,186	1.8	2.1	1.8	80	73	78
Smallpox.....	139	139	170	.1	.1	.1	273	293	283
Tuberculosis (all forms).....	89,420	86,712	82,468	76.4	73.1	68.5	-----	-----	-----
Tuberculosis (respiratory system).....	71,949	70,400	66,313	68.5	66.1	61.4	-----	-----	-----
Typhoid fever.....	5,909	5,117	5,998	5.0	4.3	5.0	5	4	4
Whooping cough.....	5,862	6,815	5,327	5.0	5.7	4.4	27	28	3

Diphtheria.—The case and death rates for diphtheria in 1930 were the lowest ever recorded by the Public Health Service. The case rate was 54.2 and the death rate was 4.9 per 100,000 population. Ten years ago, in 1920, the diphtheria case rate was 155 per 100,000 and the death rate 15.3. In 10 years the case rate has been reduced approximately two-thirds and the death rate more than two-thirds.

Influenza.—During the calendar year 1930 the incidence of influenza in the United States was unusually low. The death rate from the disease was 18.7 per 100,000 population, as compared with 54.6 in 1929 and 42.1 in 1928. The death rates for influenza and pneumonia combined for the three years were as follows: 1930, 101.8; 1929, 149; 1928, 143.2.

Malaria.—In 1930 the malaria rate continued its decline. The rate for this disease in the United States has been decreasing for several years. There was a break in this trend in 1928, which year showed a considerable increase, especially in certain sections of the South. The reports for 1930, which give a death rate for malaria of 2.8 as compared with 3.7 per 100,000 in 1928, indicate a reduction in practically every section.

Measles.—The prevalence of measles during the calendar year 1930 increased slightly over that for the preceding year, 394,884 cases, as compared with 362,298 in 1929. In 1928 more than 550,000 cases of measles were reported to the Public Health Service.

Meningococcus meningitis.—Meningococcus meningitis (cerebrospinal meningitis) has been increasing in prevalence in the United States for several years. In 1924 the case rate per 100,000 was 1.9 and the death rate was 0.8, while in 1930 these rates were 6.8 and 3.0, respectively.

Pellagra.—The death rate for pellagra declined slightly in 1930 as compared with 1928 and 1929, but was higher than for any of the years during the period 1924–1927. The prevalence of this disease has been somewhat high during the period 1928–1930, and incomplete reports indicate some increase during the first six months of 1931.

Poliomyelitis.—During the calendar year 1930, 8,185 cases of poliomyelitis (infantile paralysis) were reported to the Public

Health Service by the State health departments, as compared with 2,742 cases in 1929, 4,772 in 1928, 8,933 in 1927, and 2,438 in 1926. During the latter part of the fiscal year it was noted that the number of cases of poliomyelitis was increasing more rapidly than was to be expected from a normal seasonal fluctuation. As was pointed out in Public Health Reports, the far West and Mississippi Valley were the areas chiefly affected in 1930, whereas toward the midyear of 1931 the tendency of increased prevalence appeared in States along the Atlantic coast and the East North Central group, with very little rise in the Western States.

Scarlet fever.—In 1930 the prevalence of scarlet fever declined slightly as compared with 1929. The death rate for the disease was 1.8 per 100,000 population, the same as in 1928, as compared with 2.1 in 1929.

Smallpox.—The prevalence of smallpox has been increasing in parts of the United States for several years. In 1930, 48,033 cases were reported to the Public Health Service by 44 States, as compared with 40,706 cases in 1929. Fortunately the disease has been mild, with very few deaths in comparison with the large number of cases reported. The prevalence of the mild form, however, creates indifference among the people regarding vaccination, and leaves a fertile field for the virulent form of infection, which has disastrously attacked certain communities in the United States during the last decade. The increased incidence in 1930 was largely confined to States which have had high case rates for many years, and a large proportion of the cases reported were confined to a comparatively few States.

Tuberculosis.—The calendar year 1930 recorded a new minimum death rate for tuberculosis, 68.5 per 100,000 population, superseding the record low rate of 73.1 established in 1929. The record for tuberculosis of the respiratory system, which causes approximately 90 per cent of the deaths attributed to all forms of tuberculous disease, shows the same favorable decline, the death rate dropping from 66.1 per 100,000 in 1929 to 61.4 in 1930. The rate in 1928 was 68.5 per 100,000. At the beginning of the present century the rate was 200 per 100,000.

Typhoid fever.—Typhoid fever has been decreasing in prevalence in the United States ever since comparable yearly statistics of cases and deaths have been available, thanks to the modern science of sanitation. During the calendar year 1930 a slight reaction was shown by the reports. The case rate for 1930 was 22 per 100,000 population, as compared with 19 per 100,000 in 1929. The corresponding death rates were 5 and 4.3 per 100,000, respectively. It is believed that the increase reported during the last six months of 1930, in some States, at least, may have been due in part to the drought, which resulted in pollution and the necessity for using water from new sources.

INQUIRIES AS TO HEALTH CONDITIONS

Many letters of inquiry were received by the division regarding health conditions and asking for the compilation of statistical data. Many persons expecting to travel in the United States or abroad,

or having relatives traveling away from home, requested information regarding the prevalence of disease in certain States or countries. The information requested was supplied whenever the necessary data could be secured.

DIRECTORIES OF HEALTH OFFICERS

During the fiscal year annual directories of State health officers, of whole-time county health officers, and of city health officers were compiled and issued by the division. The State directory gave information regarding the administrative organization of each State department of health, the names of the bureaus and divisions and of the heads of such units, the appropriations for the work of each department, and the publications issued by the department. The city directory gave the names, official titles, and addresses of all city health officers in cities having over 10,000 population, and for a few of the larger cities the chiefs of the bureaus and divisions were listed.

SURVEY OF HEALTH EDUCATION BY RADIO IN THE UNITED STATES

During the year the division made a survey, by means of questionnaires, of health education by radio in the United States sponsored by official State and local health authorities and by county medical societies. It was shown by the information compiled from this survey that 15 State health departments regularly issued broadcasts on public health subjects, usually weekly or twice monthly, while 6 issued broadcasts at irregular intervals; 18 of the large cities broadcast public health information regularly, usually weekly or twice a month, and 17 at irregular intervals; and 42 county medical societies prepare and broadcast regularly programs dealing with public and personal health. The information secured in the survey was prepared for presentation to the Committee of the World Association for Adult Education by Radio at the meeting to be held in Vienna during August, 1931.

It is of interest to note here that the use of radio broadcasting in the United States as a means of disseminating information relating to public health and hygiene dates from 1921, when the United States Public Health Service first adopted this means of health education. It was in the following year that State health departments began to emulate the the Public Health Service and adopted radio broadcasting as a means of giving out health information.

RADIO LECTURES BY THE PUBLIC HEALTH SERVICE

The health information by radio service was continued for the tenth consecutive year. The lectures cover a wide range of health subjects, among which may be mentioned the following: Indigestion, psoriasis, climate and tuberculosis, rheumatism, psittacosis, hygienic adjustment throughout life, proper food, care of the hair and scalp, and goiter.

At the present time two lectures a month are mailed from Washington to approximately 250 radio stations throughout the country that are cooperating with the Public Health Service in the dissemination of this radio health advice.

In addition to the radio broadcasts a number of articles were prepared during the year, at the request of unofficial public health organizations.

This material is prepared in nontechnical language, so that it will be easily understood by the layman. A number of the cooperating radio stations broadcast the lectures, then turn them over to local newspapers for reprinting. In this way the information reaches a large number of interested persons.

LEGISLATION AND COURT DECISIONS RELATING TO PUBLIC HEALTH

State and Federal laws and regulations.—During the fiscal year work was carried on in connection with the compiling of those State and Federal public health laws and regulations which were adopted during the year 1929. This compilation, which is one of a series dating from 1911, was almost ready to go to the printer at the close of the fiscal year.

Another publication which was nearing completion at the end of the year is one that will contain the existing State statutes and regulations dealing with the reporting of morbidity, together with an analysis of such legislation and a review of the court decisions on the subject.

The State and Federal health laws and regulations adopted during 1930 were also collected.

Municipal ordinances and regulations.—For use in a compilation of selected municipal health ordinances and regulations covering a period of years, there were collected those ordinances and regulations affecting public health which were adopted during 1930 by cities in the United States of 10,000 population or over. Such city health ordinances and regulations have been compiled and published by the Public Health Service since 1910.

Court decisions.—There was continued the abstracting and publication of current court decisions relating to public health. Such decisions of State and Federal courts of last resort were obtained by searching current digests, and abstracts of such decisions were prepared and published in the Public Health Reports. Work was also done looking to the issuance of a digest of such decisions when the number available warrants such issuance.

Comptroller General's decisions.—Those decisions of the Comptroller General of the United States which related directly to the Public Health Service were abstracted and indexed throughout the year.

Requests for information.—Many requests were received during the year for information and data concerning health laws, regulations, and court decisions. These requests were complied with to the fullest extent possible.

PUBLICATIONS ISSUED BY THE DIVISION

The Public Health Reports (vol. 45, pt. 2, and vol. 46, pt. 1) was issued by the division each week during the fiscal year. This publication was established in 1878 and has been issued regularly each week since 1887. It contained current reports showing the prevalence of communicable diseases in the United States (some of the

more important diseases being reported by weeks and other diseases by months), reports of the quarantinable diseases occurring throughout the world, articles presenting the results of research work conducted by the Public Health Service in the various fields of public health, articles on public health administration, and abstracts of current court decisions relating to public health. The Public Health Reports is the official medium of the United States Public Health Service for the publication of reports on current morbidity, current research work, and other public health information for the collection and dissemination of which the Public Health Service is authorized by law.

The 52 issues of Public Health Reports printed during the year contained 3,285 pages, exclusive of title-pages and tables of contents, as compared with 3,143 pages in 1930, 3,362 in 1929, 3,189 in 1928, and 3,520 in 1927. The number of each issue at the close of the fiscal year was 9,500 copies. The increase of about 1,000 copies as compared with last year was principally due to a larger administrative distribution and to congressional requests.

Ninety-seven of the most important articles appearing in Public Health Reports during the year were reprinted in pamphlet form, as compared with 94 during the preceding year. The Public Health Reports is being used to an increasing extent for the early publication of reports from the National Institute of Health, especially those for which it is desirable to secure prompt publication and those which are not of sufficient length to be printed as monographs.

Eleven supplements to Public Health Reports were prepared for publication in the division during the fiscal year, most of which were delivered from the printer. Of especial interest were the compilation of State laws relating to narcotic drug addiction and a pamphlet on the rat proofing of vessels. The compilation of narcotic laws included a discussion of the evolution of such laws and of the scope of the present laws on the subject. The laws themselves were presented under three headings, viz: (1) Control of Narcotic Drugs, (2) Treatment and Commitment of Drug Addicts, and (3) Instruction in the Public Schools Regarding the Effects of Narcotics upon the Human System. The supplement on the rat proofing of vessels was a concise but comprehensive review of the development of the work by the Public Health Service, with many representative illustrations of corrected conditions aboard vessels and the general detailed instructions promulgated by the American Standards Committee.

The division also issued the National Negro Health Week Bulletin and Poster for 1931, the bulletin containing the outline of the program for effective community effort directed to important health problems and the poster containing stimulative suggestions for health work on a year-round basis.

New editions were issued of 14 previously issued publications.

SECTION OF PUBLIC HEALTH EDUCATION

During the fiscal year ended June 30, 1931, 116 new service publications were distributed by the Section of Public Health Education, as compared with 127 during the preceding year. The total

distribution of copies of these publications and of editions of previously published documents aggregated 528,257, as compared with 366,690 distributed during the preceding fiscal year. Out of the 528,257 copies distributed during the fiscal year 1931, 270,126 were sent in response to individual requests for information. The other copies were distributed to the various mailing lists maintained by the Public Health Service for the distribution of its publications. The figures given do not include the publications printed and distributed by the Division of Venereal Diseases, nor the service regulations and official service roster distributed by the chief clerk's office.

During this fiscal year a total of 32 requests were received for the loan of stereopticon slides. In response to these requests, a total of 1,648 slides were lent. These slides were lent to universities, health officers, public health lecturers, and others interested in the use of stereopticon slides for visual education on health subjects. As in previous years, it was not possible to supply all of the slides requested, due to the fact that the work of the stereopticon library has been somewhat handicapped during the past 12 years on account of the shortage of slides and the lack of funds for making new slides and replacement of those that have been broken or lost from time to time in shipment.

Each year a large number of requests are received by the Public Health Service from State and local health authorities, scientific associations, colleges, schools, and various other organizations for material that might be used for exhibit purposes in connection with the promotion of the public health. For the past several years compliance with these requests has not been possible, due to the lack of funds for the preparation of suitable exhibit material. An appropriation for the preparation of exhibits designed to demonstrate the cause, prevalence, and methods of spread of diseases dangerous to the public health and measures for preventing them became available during this fiscal year. Several creditable exhibits were prepared. Among the subjects covered were Rocky Mountain spotted fever, leprosy, and milk sanitation. Exhibits on undulant fever and tularaemia were presented at the meeting of the Dallas Southern Clinical Society, held at Dallas, Tex., March 30 to April 3, 1931. Exhibits on silicosis and postvaccinal tetanus were prepared for display at the annual meeting of the American Medical Association, which was held at Philadelphia, June 8 to 12, 1931. An exhibit with regard to the progress made in the scientific investigations conducted by the service concerning the diseases of man was also prepared for display at the Congress of Military Medicine and Surgery, which was held at The Hague, Netherlands, near the close of the fiscal year.

Several motion-picture films on malaria control were added to the collection of films, which were of considerable value in connection with the efforts now being made to eliminate this disease.

PUBLICATIONS DISTRIBUTED BY THE DIVISION

The following is a list of publications distributed by the division during the fiscal year:

REPRINTS FROM THE PUBLIC HEALTH REPORTS

1365. Seamen with Venereal Disease in the Port of New York. A cooperative study participated in by the American Social Hygiene Association, the New York Tuberculosis and Health Association, the Welfare Council of New York City, and the United States Public Health Service. Prepared by Annabel M. Stewart. April 11, 18, and 25, 1930. 98 pages; 2 plates.
1366. Psittacosis: Rickettsialike Inclusions in Man and in Experimental Animals. By R. D. Lillie. April 11, 1930. 6 pages.
1370. Effect of Radiant Energy on the Skin Temperatures of a Group of Steel Workers. By J. J. Bloomfield, James E. Ives, and Rollo H. Britten. May 2, 1930. 13 pages; 1 plate.
1371. Observations on the Possibility of Methyl Chloride Poisoning by Ingestion with Food and Water. By W. P. Yant, H. W. Shoaf, and J. Chornyak. May 9, 1930. 8 pages.
1372. Extent of Rural Health Service in the United States 1926-1930. By L. L. Lumsden. May 9, 1930. 17 pages.
1373. Hearing of School Children as Measured by the Audiometer and as Related to School Work. A study of 710 children in Washington, D. C., and 1,150 in Hagerstown, Md. By E. Blanche Sterling and Elizabeth Bell. May 16, 1930. 14 pages.
1374. The Type Distribution of Meningococci in the United States During 1928 and 1929. By Sara E. Branham, Clara E. Taft, and Sadie A. Carlin. May 16, 1930. 6 pages.
1375. An Anemia of Dogs Produced by Feeding Onions. By W. H. Sebrell. May 23, 1930. 17 pages.
1376. Public Health Administration. By Allan J. McLaughlin. May 23, 1930. 10 pages.
1377. Sickness Among Industrial Employees During the Last Three Months of 1929. By Dean K. Brundage. May 23, 1930. 3 pages.
1378. The Abusive Use of Narcotic Drugs in Egypt. A review. By W. L. Treadway. May 30, 1930. 4 pages.
1379. Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds. II. Ethyl Benzene. By W. P. Yant, H. H. Schrenk, C. P. Waite, and F. A. Patty. May 30, 1930. 10 pages.
1380. Occupational Mortality as Indicated in Life-Insurance Records for the Years 1915-1926. By Rollo H. Britten. May 30, 1930. 9 pages.
1381. A Study of the Blacktongue Preventive Value of Lard, Salt Pork, Dried Green Peas, and Canned Haddock. By Joseph Goldberger, G. A. Wheeler, L. M. Rogers, and W. H. Sebrell. June 6, 1930. 12 pages.
1382. Ctenocephalides, New Genus of Fleas Type *Pulex Canis*. By C. W. Stiles and Benjamin J. Collins. June 6, 1930. 2 pages.
1383. Undulant Fever in Ware County, Ga. By George E. Atwood and H. E. Hasseltine. June 13, 1930. 12 pages.
1384. The Visible Effect of Castor-Oil Soap on Certain Organisms. By R. R. Spencer. June 13, 1930. 8 pages.
1385. Medical Service in Federal Prisons. By W. L. Treadway. June 13, 1930. 8 pages.
1386. Psittacosis Outbreak in a Department Store. By L. F. Badger. June 20, 1930. 6 pages.
1387. The National Institute of Health, successor to the Hygienic Laboratory. June 20, 1930. 4 pages.
1388. Results of the Operation of the Standard Milk Ordinance in Mississippi. By A. W. Fuchs and H. A. Kroeze. June 20, 1930. 9 pages.
1389. Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds. III. "Cellosolve" (Monoethyl Ester of Ethylene Glycol). By C. P. Waite, F. A. Patty, and W. P. Yant. June 27, 1930. 8 pages.
1390. A Quantitative Colorimetric Reaction for the Ergot Alkaloids and its Application in the Chemical Standardization of Ergot Preparations. By Maurice I. Smith. June 27, 1930. 15 pages.
1391. Third Report on a Rat-Flea Survey of the City of San Juan, Porto Rico. by A. L. Carrión. July 4, 1930. 6 pages.
1392. Experimental Studies of Water Purification. IV. Observations on the Effects of Certain Modifications in Coagulation-Sedimentation on the Bacterial Efficiency of Preliminary Water Treatment in Connection

- with Rapid Sand Filtration. By H. W. Streeter. July 4 and 11, 1930. 42 pages.
1393. A Public-Health Survey of Iowa. By A. J. McLaughlin. July 11, 1930. 25 pages.
1394. The Prevalence and Trend of Meningococcus Meningitis in the United States. By R. C. Williams. July 18, 1930. 4 pages.
1395. Recent Progress in Studies of Undulant Fever. By H. E. Hasseltine. July 18, 1930. 7 pages.
1396. Pharmacological and Chemical Studies of the Cause of So-called Ginger Paralysis. A preliminary report. By Maurice I. Smith and E. Elvove, with the cooperation of P. J. Valaer, jr., William H. Frazier, and G. E. Mallory. July 25, 1930. 14 pages.
1397. Relation Between Trypanocidal and Spirocheticidal Activities of Neosphenamine. By T. F. Probey and G. W. McCoy. July 25, 1930. 12 pages.
1398. Decrease of Hookworm Disease in the United States. By C. W. Stiles. August 1, 1930. 19 pages.
1399. The Proposed Morbidity Reporting Area. By R. C. Williams. August 1, 1930. 6 pages.
1400. The Present Status of Streptococcus Biologic Products in the Prevention and Treatment of Scarlet Fever. By M. V. Veldee. August 8, 1930. 5 pages.
1401. Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds. IV. Ethylene Oxide. By C. P. Waite, F. A. Patty, and W. P. Yant. August 8, 1930. 12 pages.
1402. The Immunizing Value of Diphtheria Toxin-Antitoxin Mixture and of Diphtheria Toxoid. By W. T. Harrison. August 15, 1930. 6 pages.
1403. Antirabic Vaccine Paralysis. Consideration of various vaccines. By G. W. McCoy. August 15, 1930. 4 pages.
1404. Physical Impairments and Occupational Class. Differential rates based upon medical examinations of 100,924 native-born, adult white insured males. By Edgar Sydenstricker and Rollo H. Britten. August 22, 1930. 36 pages.
1405. Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds. V. Vinyl Chloride. By F. A. Patty, W. P. Yant, and C. P. Waite. August 22, 1930. 9 pages.
1406. Psittacosis. Epidemiological Considerations with Reference to the 1929-30 Outbreak in the United States. By Charles Armstrong. August 29, 1930. 11 pages.
1407. Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds. VI. Dioxan. By W. P. Yant, H. H. Schrenk, F. A. Patty, and C. P. Waite. August 29, 1930. 10 pages.
1408. Public Health Service Publications. A list of publications issued during the period July, 1929-June, 1930. August 29, 1930. 7 pages.
1409. Chief Etiological Factors of Plague in Ecuador and the Antiplague Campaign. By C. R. Eskey. September 5 and 12, 1930. 64 pages; 2 plates.
1410. Biological Products. Establishments licensed for the propagation and sale of viruses, serums, toxins, and analogous products. September 5, 1930. 5 pages.
1411. Bacillus Psittacosis Nocard, 1893. Failure to find it in the 1929-30 epidemic in the United States. By Sara E. Branham, George W. McCoy, and Charles Armstrong. September 12, 1930. 8 pages.
1412. A College Course in Child Hygiene. By E. Blanche Sterling. September 12, 1930. 4 pages.
1413. Electron Equilibria in Biological Systems. IV. An Adaptation of the Glass Electrode to the Continuous Measurement of Hydrogen Ion Concentration of the Circulating Blood. By Carl Voegtlin, Floyd DeEds, and H. Kahler. September 19, 1930. 10 pages.
1414. The United States Public Health Service as a Career. Information for persons desiring to enter the regular commissioned corps. September 19, 1930. 14 pages; 6 plates.
1415. Mortality from Influenza and Pneumonia in 50 Large Cities of the United States, 1910-1929. By Selwyn D. Collins, W. H. Frost, Mary Gover, and Edgar Sydenstricker. September 26, 1930. 52 pages.
1416. The Training of Health Officers. By Joseph W. Mountin. October 3, 1930. 5 pages.

1417. A Note on the "Zone Phenomenon" in Human Sera. A comparison of antitularense with antiabortus sera. By R. R. Spencer, October 3, 1930. 4 pages.
1418. A Study of the Effect of Typhoid Vaccine when Given After Infection. By J. H. Crouch. October 10, 1930. 4 pages.
1419. The Pharmacological Action of Certain Phenol Esters, with Special Reference to the Etiology of So-called Ginger Paralysis. (Second report.) By Maurice I. Smith, with the cooperation of E. Elvove and W. H. Frazier. October 17, 1930. 16 pages.
1420. Sickness Among Industrial Employees in the First Half of 1930. October 24, 1930. 2 pages.
1421. Cooperative Rural Health Work of the Public Health Service in the Fiscal Year 1930. By L. L. Lumsden. October 24, 1930. 21 pages.
1422. A Note on the Incidence of Endemic Goiter in Northern Ireland. By Robert Olesen and Paul A. Neal. October 31, 1930. 4 pages.
1423. The Influence of the Size of the Explant Upon Cultures of Chick Fibroblasts in Vitro. By W. R. Earle and J. W. Thompson. October 31, 1930. 27 pages; 8 plates.
1424. The Essentials of Smallpox Vaccination. By James P. Leake and John N. Force. November 14, 1930. 5 pages.
1425. State and Insular Health Authorities, 1930. Directory, with data as to appropriations and publications. November 14, 1930. 23 pages.
1426. City Health Officers, 1930. Directory of those in cities of 10,000 or more population. November 14, 1930. 16 pages.
1427. An Unusually Mild Recurring Epidemic Simulating Food Infection. By R. R. Spencer. November 21, 1930. 11 pages.
1428. Mottled Enamel in a Segregated Population. By Grover A. Kempf and Frederick S. McKay. November 28, 1930. 18 pages; 3 plates.
1429. Trachoma. Some Facts About the Disease and Some Suggestions for Trachoma Sufferers. By Paul D. Mossman. November 28, 1930. 5 pages; 2 plates.
1430. Venereal Disease Among Coast Guard Enlisted Personnel During the Fiscal Year 1929. By W. W. King. December 5, 1930. 16 pages.
1431. Military Lung Disease Due to Unknown Cause. By R. R. Sayers and F. V. Meriwether. December 5, 1930. 16 pages; 2 plates.
1432. The Chemistry of Cell Division. I. The Effect of Glutathione on Cell Division in Amoeba Proteus. By Carl Voegtlin and H. W. Chalkley. December 12, 1930. 23 pages.
1433. The Blacktongue Preventive Value of Minot's Liver Extract. By Joseph Goldberger and W. H. Sebrell. December 12, 1930. 7 pages.
1434. Experimental Studies of Water Purification. V. Prechlorination in Relation to the Efficiency of Water Filtration Processes. By H. W. Streeter and C. T. Wright. December 19, 1930. 24 pages.
1435. Consecutive Readings of Pulse Rate on a Small Group of Clerks. By Rollo H. Britten and C. R. Wallace. December 19, 1930. 7 pages.
1436. Whole-Time County Health Officers, 1930. December 19, 1930. 8 pages.
1437. Summary of a Study of Health and Hospital Services in Alameda County, Calif. By Joseph W. Mountin. December 26, 1930. 16 pages.
1438. Further Biochemical Studies on the Antineuritic Vitamin. By Atherton Seidell and Maurice I. Smith. December 26, 1930. 12 pages.
1439. Studies on Leptospira Icterohemorrhagiae. By J. R. Ridlon. January 2, 1931. 5 pages.
1440. The National Leper Home (United States Marine Hospital), Carville, La. Review of the more important activities during the fiscal year ended June 30, 1930. By E. O. Denney. January 2, 1931. 8 pages; 2 plates.
1441. The Occurrence of Tularaemia in British Columbia. By R. R. Parker, Eric Hearle, and E. A. Bruce. January 9, 1931. 2 pages.
1442. Effect on Life Insurance Mortality Rates of Rejection of Applicants on the Basis of Medical Examination. By Rollo H. Britten. January 9, 1931. 17 pages.
1443. Age Incidence of Communicable Diseases in a Rural Population. By Edgar Sydenstricker and Selwyn D. Collins. January 16, 1931. 14 pages.
1444. The Incidence of Influenza Among Persons of Different Economic Status During the Epidemic of 1918. By Edgar Sydenstricker. January 23, 1931. 17 pages.
1445. The Stillbirth Problem in the United States. By E. Blanche Sterling. January 30, 1931. 8 pages.

1446. Public Health Service Publications. A list of publications issued during the period July-December, 1930. January 30, 1931. 5 pages.
1447. The Work of the United States Public Health Service. February 6, 1931. 30 pages.
1448. Typhus Fever. A virus of the typhus type derived from fleas collected from wild rats. By R. E. Dyer, A. Rumreich, and L. F. Badger. February 13, 1931. 5 pages.
1449. The Influence of Arsenicals and Crystalline Glutathione on the Oxygen Consumption of Tissues. By Carl Voegtlin, Sanford M. Rosenthal, and J. M. Johnson. February 13, 1931. 16 pages.
1450. Studies on the Biochemistry of Sulphur. IX. The Estimation of Cysteine in the Presence of Glutathione. By M. X. Sullivan and Walter C. Hess. February 20, 1931. 4 pages.
1451. Experimental Studies of Natural Purification in Polluted Waters. IV. The Influence of the Plankton on the Biochemical Oxidation of Organic Matter. By C. T. Butterfield, W. C. Purdy, and E. J. Theriault. February 20, 1931. 34 pages.
1452. An Infection of the Rocky Mountain Spotted Fever Type. Identification in the Eastern part of the United States. By L. F. Badger, R. E. Dyer, and A. Rumreich. February 27, 1931. 8 pages.
1453. The Typhus-Rocky Mountain Spotted Fever Group. An epidemiological and clinical study in the Eastern and Southeastern States. By A. Rumreich, R. E. Dyer, and L. F. Badger. February 27, 1931. 12 pages.
1454. Note on an Outbreak of Malaria in a Railroad Camp, Rawson Switch, Calif. By J. C. Geiger and J. P. Gray. March 6, 1931. 4 pages.
1455. Measurements for Jaeger's Test Types Used in Near Vision Tests. March 6, 1931. 4 pages.
1457. A Limited Rat-Flea Survey of Savannah, Ga. By Carroll Fox. March 13, 1931. 2 pages.
1458. A Public-Health Survey of Oklahoma. By A. J. McLaughlin. March 13, 1931. 24 pages.
1459. Conference on Medicinal and Scientific Requirements of Narcotic Drugs, Washington, D. C., August 12, 1930. A summary of the proceedings. October 3, 1930. 14 pages.
1460. The Fundamentals of Public Health Law. By James E. Bauman. March 20, 1931. 10 pages.
1462. Antigenic Value of Scarlet Fever Streptococcus Toxin Modified by the Action of Formalin. By M. V. Veldee. March 27, 1931. 6 pages.
1464. Act Extending the Hours of Quarantine Inspection. March 27, 1931. 4 pages.

SUPPLEMENTS TO THE PUBLIC HEALTH REPORTS

85. The Notifiable Diseases. Prevalence During 1929 in Cities of Over 100,000. 1930. 29 pages.
86. Studies on the Biochemistry of Sulphur. VII. The Cystine Content of Purified Proteins. By M. X. Sullivan and W. C. Hess. 1930. 11 pages.
87. The Notifiable Diseases. Prevalence During 1929 in Cities of 10,000 to 100,000 Population. 1930. 83 pages.
88. The Notifiable Diseases. Prevalence During 1929 in States. 1931. 70 pages.
89. Studies on the Biochemistry of Sulphur. VIII. The Rate of Absorption of Cystine from the Gastrointestinal Tract of the White Rat. By M. X. Sullivan and W. C. Hess. 1931. 16 pages.
90. Detailed Instructions for the Performance of the Dissolved Oxygen and Biochemical Oxygen Demand Tests. By Emery J. Theriault. 1931. 34 pages.
91. State Laws Relating to the Control of Narcotic Drugs and the Treatment of Drug Addiction. 1931. 330 pages.
92. Studies on Oxidation-Reduction. XVI. The Oxazines; Nile Blue, Brilliant Cresyl Blue, Methyl Capri Blue, and Ethyl Capri Blue. By Barnett Cohen and Paul W. Preisler. 1931. 67 pages.
94. Studies on the Biochemistry of Sulphur. X. The Cystine Content of Meat and Fish. By M. X. Sullivan and W. C. Hess. 1931. 13 pages.
95. A Nomogram for the Calculation of Dissolved Oxygen. By C. T. Wright and Emery J. Theriault. 1931. 3 pages.

PUBLIC HEALTH BULLETINS

197. Studies in Illumination. III. A Study of the Loss of Light Due to Smoke on Manhattan Island, New York City, During the Year 1927, Especially in its Relation to the Nature of the Weather, the Relative Humidity of the Air, and the Velocity and Direction of the Wind. By James E. Ives. 1930. 40 pages.
198. A Study of the Pollution and Natural Purification of the Illinois River. II. The Plankton and Related Organisms. By W. C. Purdy. 1930. 212 pages; 42 plates.
199. Studies in Physical Development and Posture. IV. Postural Relations as Noted in Twenty-two Hundred Boys and Men. By Louis Schwartz, Rollo H. Britten, and Lewis R. Thompson. 1931. 54 pages; 16 plates.

NATIONAL INSTITUTE OF HEALTH BULLETINS ¹

155. 1. Key Catalogue of Parasites Reported for Chiroptera (bats) with Their Possible Public Health Importance. By C. W. Stiles and Mabelle Orleman Nolan. 2. The Confused Nomenclature of *Nycteribia Latreille*, 1796, and *Spinturnix Heyden*, 1826. By Benjamin J. Collins. 1931. 187 pages.
156. The Pathology of Generalized Vaccinia in Rabbits. By Ralph D. Lillie and Charles Armstrong. 1930. 95 pages; 65 plates.
157. Experimental Syphilis. Lymph gland transfer method of determining human infection with *Treponema pallidum*. By G. C. Lake and K. K. Bryant. 1930. 41 pages.
158. Undulant Fever. With special reference to a study of "Brucella" infection in Iowa. By A. V. Hardy, C. F. Jordan, I. H. Borts, and Grace Campbell Hardy. 1931. 89 pages; 7 plates.

ANNUAL REPORT

Annual Report of the Surgeon General of the United States Public Health Service for the Fiscal Year 1930. 358 pages.

MISCELLANEOUS PUBLICATIONS

11. Official List of Commissioned and Other Officers of the United States Public Health Service; also, List of United States Marine Hospitals, Quarantine, Immigration, Relief Stations, and Quarantine Vessels. October 1, 1930. 86 pages.
29. Manual of Hospital Management for United States Marine Hospitals. By M. H. Foster. 303 pages; 1 plate.

UNNUMBERED PUBLICATIONS

National Negro Health Week Program. This pamphlet is published annually, usually about the middle of March, for community leaders in an effort to suggest ways and means by which interested individuals and organizations may be organized for a concerted and effective attack upon the community's disease problems. Seventeenth annual observance. 1931. 16 pages. (Out of print.)

National Negro Health Week Poster. Seventeenth Annual Observance. 1931. (Out of print.)

¹ This series of publications was formerly issued under the title of "Hygienic Laboratory Bulletins." The name of the Hygienic Laboratory was changed to National Institute of Health by act of Congress approved May 26, 1930.

DIVISION OF MARINE HOSPITALS AND RELIEF

In charge of Asst. Surg. Gen. F. C. SMITH

Industrial depression and even a temporary decline in shipping activities did not lessen the demands for medical treatment at marine hospitals and other relief stations. There was, on the contrary, an increase over the preceding year of 3.3 per cent in the amount of hospital treatment and of 14 per cent in out-patient treatment furnished to seamen from American merchant vessels. Beneficiaries took advantage of a slack season to seek surgical operations long deferred and treatment for disabilities neglected in prosperous and busier times. Admission to hospital was requested by a considerable number of beneficiaries who in normal seasons could have been cared for as out-patients. Discharges from hospital were slightly retarded by the reluctance of indigent convalescents to leave because of precarious employment conditions. The temptation for unemployed former seamen to attempt to gain entrance to marine hospitals by the use of out-dated or fraudulent master's certificates was increased. A total of 363,129 persons applied for treatment, physical examination, or other kind of medical service, and to legal beneficiaries of all classes, an aggregate of 1,666,215 days and 910,466 out-patient treatments were given. One thousand three hundred and four deaths occurred in hospital. For purposes other than treatment, 94,487 physical examinations were also made at the request of the Steamboat Inspection Service, Civil Service Commission, and other governmental agencies; it was not possible fully to meet all demands when very large numbers of civil-service applicants presented themselves for temporary seasonal appointments. In cooperation with the Bureau of Industrial Alcohol, 7,332 certificates of medicinal need of liquors were issued to vessels. For the various services rendered to the several classes of beneficiaries in different ports see the following tabulated statements:

Transactions at each marine hospital and relief station, Table 2, page 261.

Causes of admission and condition on discharge, Table 4, page 268.

Causes of death, Table 5, page 270.

Number of days in hospital for various disabilities, Table 7, page 273.

Nativity of patients, Table 9, page 275.

American seamen and specified diseases and injuries, Table 11, page 278.

CLASSES OF BENEFICIARIES AND AMOUNT AND CHARACTER OF SERVICES RENDERED

Summary of services by class of beneficiary

Class of beneficiary	Hospital days		Out-patient treatments		Physical examinations (not related to treatment)		Remarks
	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total	
American merchant seamen.	990,205	59.43	472,392	51.88	13,605	14.40	Communicable diseases are reported to local health officers.
Veterans.....	307,185	18.44	4,354	.48	1,321	1.40	Patients of the U. S. Veterans' Administration.
Lepers.....	116,279	6.98	1	-----	1	-----	National Leper Home, Carville, La.
U. S. Coast Guard personnel	86,829	5.22	187,063	20.54	11,964	12.66	All medical services and supplies, ashore and afloat.
Injured Federal employees.	57,042	3.42	179,029	19.67	22,343	23.66	Patients of the Employees' Compensation Commission.
Immigrants.....	40,904	2.45	2,560	.28	732	.77	Patients of the Bureau of Immigration.
Seamen, U. S. Engineer Corps and Army Transport Service.	34,433	2.07	10,250	1.13	154	.16	Civilian employees on U. S. Army vessels.
Seamen from foreign vessels.	7,459	.44	778	.09	39	-----	Pay patients.
Seamen and keepers, U. S. Lighthouse Service.	10,846	.65	6,096	.67	192	.20	Medical supplies also furnished to lighthouse vessels.
Alaska cannery workers leaving United States.	-----	-----	418	.04	6,674	7.07	Vaccinations and other preventive measures.
Pilots and other licensees	-----	-----	-----	-----	6,785	7.19	For the Steamboat Inspection Service.
United States civil-service applicants and employees.	-----	-----	-----	-----	19,929	21.09	For the Civil Service Commission.
U. S. Shipping Board	-----	-----	-----	-----	2,436	2.59	To determine fitness for sea duty.
All others entitled to treatment.	15,033	.90	47,525	5.22	8,312	8.81	From Bureau of Fisheries, Army, Navy, Mississippi River Commission, Coast and Geodetic Survey, etc.
Total.....	1,666,215	100.00	910,466	100.00	94,487	100.00	

DENTAL TREATMENT

With slightly increased dental personnel, 12,793 more patients were treated than in the preceding year. Four full-time dental officers are on duty with the Coast Guard—2 at the Academy in New London, 1 at Staten Island, and 1 at Curtis Bay, Md. During the summer months an additional dentist was assigned to the Coast Guard cutter *Northland* and one to Unalaska.

The total cost of all dental service in marine hospitals and relief stations, including the salaries of officers and assistants, and supplies and overhead cost, amounted to \$214,785.39. Had the total amount of dental treatment been procured at authorized fees by employing contract dentists instead of service dental officers, the total cost would have been \$570,597.25. The major items of treatment rendered by service dental officers were as follows:

Item	1930	1931
Number of patients treated.....	52,763	65,556
Number of complete dental examinations.....	34,140	37,701
X-ray exposures.....	17,878	21,291
Prophylactic treatment (hours).....	6,326	6,175
Vincent's stomatitis treatment (hours).....	2,318	3,567
Pyorrhea treatment (hours).....	2,273	2,218
Extractions.....	37,537	43,344
Alloy fillings.....	22,596	23,518
Gold inlays.....	780	736
Porcelain crowns.....	53	91
Silicate cement fillings.....	6,259	8,211
Dentures (full or partial).....	2,527	3,148
Bridges.....	488	1,342
Fracture cases (hours).....	312	538
Total number of treatments rendered.....	280,722	335,214

Senior Dental Surg. C. T. Messner is in charge of all dental activities in the field and the bureau.

COAST GUARD

The average number of Coast Guard beneficiaries was 13,020 on active duty and retired. The character and comparative amounts of medical service furnished in recent years are shown by the following table:

Year	Numerical strength of Coast Guard and medical services given			Average amount of medical service per person			
	Number of Coast Guard personnel	Hospital days	Out-patient treatments	Physical examinations	Hospital days	Out-patient treatments	Physical examinations
1923.....	4,684	41,681	32,530	4,207	8.9	6.7	0.9
1924.....	4,896	36,504	45,857	7,008	7.6	9.4	1.5
1925.....	7,077	60,336	90,494	13,394	8.5	12.8	1.9
1926.....	9,839	71,799	125,226	19,061	7.3	12.7	1.9
1927.....	10,984	76,564	155,977	18,787	6.9	14.2	1.7
1928.....	12,462	85,691	137,971	17,220	6.9	11.0	1.4
1929.....	12,833	88,870	169,697	17,748	6.9	13.2	1.4
1930.....	12,963	90,179	196,334	14,382	6.9	15.1	1.1
1931.....	13,020	86,829	187,063	8,262	6.7	14.4	.6

Twenty-two medical and dental officers are assigned exclusively to Coast Guard duty and 108 local physicians under appointment as acting assistant surgeons furnish medical and surgical relief and make physical examinations of Coast Guard and Lighthouse Service personnel at isolated units remote from any Public Health Service relief station.

Medical officers have been assigned, as usual, to the cutters on the international ice patrol and to those on the cadet practice cruise in European waters. Medical officers have been assigned to the Bering Sea patrol, and a dental officer was stationed at the patrol base at Unalaska during the cruising season. A medical officer and a dental officer are assigned to the *Northland* on its annual Arctic cruise to Point Barrow, Alaska. This cutter has a well-equipped dental unit and a specially appointed sick bay. The medical and dental officers, in addition to their care of Coast Guard personnel, extend medical, surgical, and dental relief to a considerable number of Alaskan natives and others to whom such relief is not otherwise available. Valuable scientific observations have also been made of medical, sanitary, and dental conditions among the natives.

During the year a dental unit was installed at the Coast Guard depot, Curtis Bay, Md., and a dental officer assigned to duty there. This unit serves a large personnel of vessels undergoing repair in addition to that of the depot. A dental unit has been installed also at Coast Guard section base No. 2, Stapleton, N. Y., and operated from the marine hospital, Stapleton, by a dental officer of the hospital staff. These dental units reach a large number of Coast Guard patients, many of whom would not otherwise receive dental attention. They relieve dental units at hospitals of much work and save a very large amount of time of Coast Guard patients. In addition to the

usual medical, dental, and surgical supplies furnished the Coast Guard, four new cutters have been equipped. Additional new outfits for one cutter and several patrol boats will be required during the coming fiscal year.

The high standard of physical examination performed at marine hospitals and elsewhere in the field has been maintained. In view of the benefits provided by law for disabilities incurred in service it is necessary to exclude persons having physical conditions that may lead to early disability and claim for pensions. The present system of making and keeping the individual medical records has been found unsatisfactory for Coast Guard needs. Also the proper consideration of claims for pensions and compensation for physical disability is hampered by lack of complete medical records. A joint board of Coast Guard and Public Health Service officers has made a detailed study of this subject and recommended a system of individual medical records, the adoption of which is now under consideration.

Special attention given to the control of venereal diseases has continued. There was a progressive decrease in the number of cases reported in 1928 and 1929 over those in 1927. The number of cases increased somewhat in 1930, but again decreased in 1931. Every decrease represents a very material saving in money and efficiency, but it is felt that the greatest possible results have not yet been attained.

Medical Director W. W. King is assigned to duty at Coast Guard headquarters as representative of the Surgeon General and chief of the medical section.

EMPLOYEES' COMPENSATION COMMISSION

When civil employees of the United States are injured while in performance of their duties they are entitled to reasonable medical and hospital services and supplies needed as a result of the injury. The law further provides that where practicable such services shall be furnished by United States medical officers and hospitals. For this purpose 25 hospitals and 118 dispensaries of the Public Health Service are available without cost, and to a limited extent other Government hospitals are also available. In localities where the Public Health Service has no medical facilities available, treatment is furnished through private physicians designated by the commission, of which some 4,000 have been selected throughout the United States.

The Public Health Service furnished service during the fiscal year as follows: 57,042 hospital days, 179,029 out-patient treatments, and 22,343 complete medical surveys. This service would have cost the compensation fund well over \$1,000,000 if obtained elsewhere.

Surg. E. C. Ernst is assigned to the United States Employees' Compensation Commission as medical director.

EXAMINATION IN FIRST AID

Ship's officers and candidates for licenses were instructed in first aid and ship sanitation at 37 of the 46 stations designated upon the request of the Steamboat Inspection Service, by whom proficiency in first aid has been required of all licensees since July 1, 1922. Approximately 94 per cent of the candidates examined were successful.

The following table shows the amount of first-aid instruction given and the results of examinations:

Instruction and examination in first aid, fiscal year 1931

Station	Number instructed	Number examined	Number passed			Number rejected			Time consumed		
			Instructed	Uninstructed	Total	Instructed	Uninstructed	Total	Instruction (hours)	Examination (hours)	Total (hours)
Aberdeen, Wash.....	0	50	0	50	50	0	0	0	0	50	50
Baltimore, Md.....	67	94	49	24	73	16	5	21	141	242	383
Bangor, Me.....	0	2	0	2	2	0	0	0	0	2	2
Boston, Mass.....	0	120	0	104	104	0	16	16	0	63	63
Buffalo, N. Y.....	0	30	0	28	28	0	2	2	0	30	30
Charleston, S. C.....	0	3	0	3	3	0	0	0	0	3	3
Chicago, Ill.....	15	10	9	1	10	0	0	0	35	12	47
Cleveland, Ohio.....	90	73	56	10	66	1	6	7	24	39	63
Detroit, Mich.....	6	11	6	5	11	0	0	0	6	9	15
Duluth, Minn.....	0	24	0	24	24	0	0	0	0	13	13
Evansville, Ind.....	0	2	1	1	2	0	0	0	0	2	2
Galveston, Tex.....	18	45	18	23	41	0	4	4	105	47	152
Grand Haven, Mich.....	0	9	0	8	8	0	1	1	0	9	9
Jacksonville, Fla.....	0	20	0	20	20	0	0	0	0	20	20
Juneau, Alaska.....	8	8	8	0	8	0	0	0	13	11	24
Louisville, Ky.....	4	8	1	7	8	0	0	0	3	8	11
Marine City, Mich.....	35	22	22	0	22	0	0	0	30	12	42
Memphis, Tenn.....	7	7	7	0	7	0	0	0	82	14	96
Milwaukee, Wis.....	0	74	0	74	74	0	0	0	0	74	74
Mobile, Ala.....	0	16	0	16	16	0	0	0	0	17	17
New Haven, Conn.....	0	8	0	8	8	0	0	0	0	8	8
New London, Conn.....	7	37	7	30	37	0	0	0	12	27	39
New Orleans, La.....	68	67	62	4	66	1	0	1	34	28	62
New York, N. Y.....	377	459	367	70	437	10	12	22	250	446	696
Norfolk, Va.....	0	73	0	50	50	0	23	23	0	93	93
Oswego, N. Y.....	1	4	1	3	4	0	0	0	1	4	5
Philadelphia, Pa.....	19	104	16	85	101	1	2	3	19	100	119
Pittsburgh, Pa.....	0	13	0	13	13	0	0	0	0	13	13
Port Huron, Mich.....	8	5	4	1	5	0	0	0	20	5	25
Portland, Ore.....	16	16	15	0	15	1	0	1	48	16	64
Providence, R. I.....	0	12	0	12	12	0	0	0	0	11	11
San Francisco, Calif.....	196	159	148	7	155	1	3	4	177	93	270
San Pedro, Calif.....	0	36	0	32	32	0	4	4	0	19	19
Savannah, Ga.....	9	11	8	3	11	0	0	0	17	23	40
Seattle, Wash.....	0	65	0	63	63	0	2	2	0	42	42
Tampa, Fla.....	0	8	0	8	8	0	0	0	0	8	8
Toledo, Ohio.....	8	8	8	0	8	0	0	0	14	12	26
Total.....	959	1,713	813	789	1,602	31	80	111	1,031	1,625	2,656

OPERATING COSTS

The appropriation of \$5,877,496 was augmented by reimbursements received from the Veterans' Administration amounting to \$1,172,889, making a total available for expenditure of \$7,050,385.

According to the classification of the General Accounting Office, the several items of expense were as follows:

01—Personal services.....	\$3,753,891
0200—Janitor and laundry supplies, X-ray films, etc.....	71,475
0210—Medical and hospital supplies.....	293,772
0220—Scientific and educational supplies.....	5,914
0230—Fuel (coal, wood, gas, and fuel oil).....	169,877
0250—Forage.....	56,251
0260—Provisions.....	1,153,726
0280—Sundry supplies (ice, hardware, etc.).....	79,071
03—Subsistence and support of persons (contract care).....	577,493
04—Care of animals.....	61
0500—Telegraph.....	990

0510—Telephone.....	\$24, 139
06—Travel expense.....	102, 444
07—Transportation of things.....	77, 774
09—Advertising.....	7
10—Furnishing heat, light, power, water (contract).....	185, 025
1100—Rent of buildings and offices.....	28, 380
1110—Other rents.....	4, 643
1280—Repairs and parts, motor vehicles.....	7, 430
1290—Alterations and repairs, other equipment.....	26, 793
1373—Laundry service.....	57, 849
1375—Ash and garbage removal.....	1, 969
1380—Miscellaneous services.....	3, 669
2250—Burials.....	28, 941
3000—Motor vehicles.....	15, 664
3010—Furniture, furnishings, and fixtures.....	124, 864
3030—Scientific and recreational equipment.....	112, 068
3040—Livestock.....	3, 842
3050—Other equipment.....	52, 539
	7, 020, 561
Reserved for unknown encumbrances.....	29, 824
	7, 050, 385

01—The item of personal services covers salaries and wages of 532 physicians and dentists, 510 nurses, aides, and dietitians, and 1,773 other employees.

0200—For soap, lye, starch, brooms, toilet paper, and other laundry supplies, \$39,251; X-ray films, \$31,909; postage stamps, \$194; etc.

0210—Gauze and cotton, \$25,047; clothing for lepers, \$13,319; anesthetics and adhesive plaster, \$5,931; catgut and other sutures, \$2,257; artificial legs, arms, braces, and other prosthetic appliances, \$4,003; etc.

0220—The principal item under this heading was \$3,126 for subscriptions to medical journals.

0230—Coal, \$81,417; wood, \$15,206; fuel oil and gas, \$73,255.

0260—This is the cost of food at \$0.53 per day for patients and personnel in marine hospitals.

0280—Ice, \$13,087; electric-light bulbs, \$2,341; gasoline, oil, and grease, \$6,996; packing boxes and materials, \$1,770, etc.

3000—Six passenger cars were purchased for \$2,819; 2 ambulances for \$5,075; 10 trucks for \$7,770.

3010—Pajamas, bath robes, sheets, pillow slips, and counterpanes, \$27,660; beds and mattresses, \$11,489; china and glassware, \$5,791; window shades, \$1,223; filing cases and desks, \$2,798; and \$75,903 for other hospital furniture and furnishings, etc.

3020—X-ray machines and tubes, \$29,732; mortuary, \$1,400; clinical thermometers, \$2,530; medical books, \$2,949; anesthesia apparatus, \$1,681; urological tables, \$2,170; diathermy machines and wheel litters, \$2,092; furniture, \$23,251; other scientific equipment, \$44,141.

3040—Livestock for Carville and Fort Stanton, \$3,842.

3050—Dish-washing machines, \$5,222; food conveyors and refrigerators, \$9,844; patients' lockers, \$1,666; typewriters and computing machines, \$4,522; kitchen and dining-room equipment, \$15,324; laundry and other equipment, \$15,961.

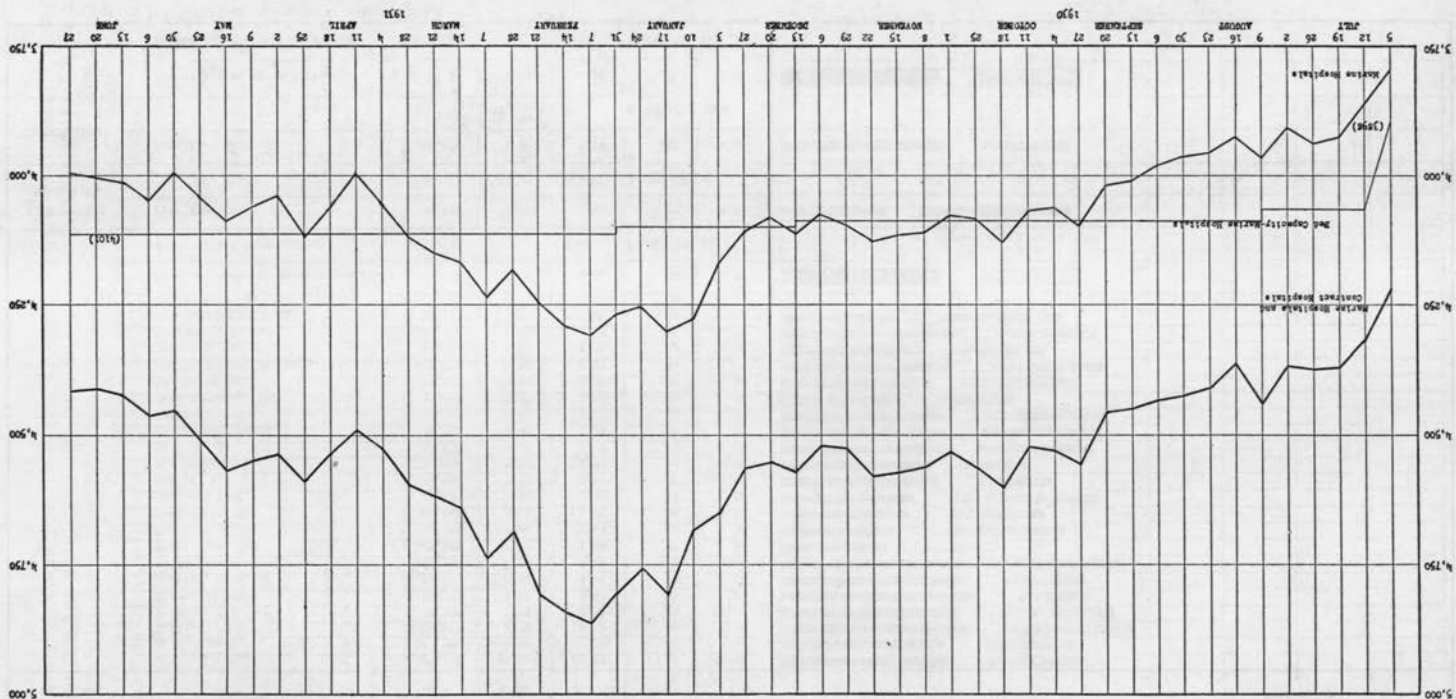
ECONOMIES

Surplus property from other Government departments valued at \$16,977.77 was acquired for the use of marine hospitals and other relief stations. Funds amounting to \$1,377.50 and \$166.20 were realized from the exchange value of old typewriters and automobiles, respectively. Two passenger-carrying vehicles were purchased at a very nominal cost at auction conducted by the General Supply Committee. Whenever possible, patients were sent to Carville, La., in groups to diminish expense of attendants.

GROUP OF HOSPITALS	HOSPITAL	COST PER PATIENT DAY					Station Production								
	LOCATION	RELIEF DAYS	TOTAL	SALARIES	FOOD	OTHER	Salaries	Food	Other	Station	Station	Production	Production	Production	Production
							1	2	3	4	5	6	7	8	
GENERAL	Baltimore, Md.	75,766	\$4.05	\$2.27	\$0.52	\$1.26									
	Boston, Mass.	56,805	3.98	2.25	.50	1.23									
	Buffalo, N. Y.	23,254	4.76	2.52	.50	1.74									
	Chicago, Ill.	58,808	4.53	2.39	.59	1.55									
	Cleveland, Ohio	76,281	4.17	2.67	.51	.99									
	Detroit, Mich.	47,817	4.08	2.45	.53	1.10									
	Ellis Island, N. Y.	163,799	4.55	2.44	.57	1.54									
	Evansville, Ind.	25,488	2.91	1.44	.51	.98									
	Key West, Fla.	32,459	3.89	1.63	.62	1.64									
	Louisville, Ky.	30,248	3.69	1.81	.48	1.40									
	Memphis, Tenn.	23,185	4.30	1.85	.56	1.88									
	Mobile, Ala.	34,505	3.70	2.19	.50	1.01									
	New Orleans, La.	141,294	3.33	2.05	.47	.81									
	Norfolk, Va.	81,656	4.26	2.12	.60	1.54									
	Pittsburgh, Penna.	31,926	4.40	2.23	.64	1.53									
	Portland, Me.	25,715	4.41	2.29	.65	1.47									
	Fort Townsend, Wash.	35,663	3.20	1.72	.53	.95									
	St. Louis, Mo.	32,479	4.02	2.03	.42	1.57									
	San Francisco, Calif.	103,010	4.39	2.33	.59	1.47									
	Savannah, Ga.	58,816	3.67	1.94	.52	1.21									
	Stapleton, N. Y.	105,222	4.25	2.43	.48	1.34									
	Vineyard Haven, Mass.	11,133	3.85	1.59	.60	1.67									
	New York, N. Y. (a)														
	Per diem cost for General hospitals		4.07	2.22	.54	1.31									
	Total Relief Days	1,281,729		Cost	\$5,213,902.27										
TUBERCULOSIS SANATORIUM	Fort Stanton, N. M.	90,574	3.94	1.41	.77	1.76									
				Cost	\$ 356,669.29										
LEPROSARIUM	Carville, La.	116,275	3.92	2.14	.52	1.26									
				Cost	\$ 455,243.86										
ALL	Per diem cost for all hospitals		4.05	2.16	.55	1.34									
	Relief days for all hospitals	1,488,581		Cost	\$6,025,815.42										

(a) In-Patient department of station closed

Average per diem cost of in-patient relief, United States Marine Hospitals, fiscal year 1931.



Patients remaining in hospitals at the end of each week, fiscal year 1931

Navy contracts were used to purchase fuel, lubricating oils, and furniture. Typhoid vaccine was purchased from the Army Medical School. Commonly used hospital supplies were purchased semi-annually and tires and tubes quarterly as definite quantity items. Repairs of quantities of unserviceable quartz burners and X-ray tubes were consolidated. Narcotics and alcoholic liquors were obtained gratis through the Bureau of Narcotics and the Chief Coordinator, respectively.

Soap was manufactured at various hospitals from waste grease, used X-ray films were dissolved in acetone to make spinal braces, and standard rather than proprietary drugs were purchased in packages of standard sizes. Before purchasing, all clinical thermometers are tested through courtesy of the Bureau of Standards, and of 12,000 thermometers tested, 349 were rejected for defects.

ABSTRACTS OF REPORTS FROM MARINE HOSPITALS AND SELECTED RELIEF STATIONS

Representative activities have been selected from the annual reports of these stations. A tabulation of all the transactions will be found on pages 259-278.

Marine hospital, Baltimore, Md.—Medical Director R. H. Creel in charge.

Plans for the new hospital are in preparation and it is expected that construction will begin by fall. The building program contemplates a 6-story fire-resistant hospital with an approximate capacity of 380 beds and auxiliary services, arranged compactly with utilities centrally located. Plans have been made for continuance of medical relief in the present institution, although this will be difficult and the bed capacity will be curtailed.

At all times the hospital was taxed beyond its normal capacity of 167 beds, the average census being in excess of 200 patients. Overcrowding rendered station administration difficult both from a professional and custodial viewpoint. Whatever merits the 1-story pavilion type of hospital may have, economy of operation is not one of them, and with a small orderly and maintenance force the task is increasingly difficult. In a number of ways administration has been facilitated by the addition of labor-saving devices, such as dish-washing machines, bread toaster, electric refrigerators, and egg timers. Treatment has been improved by such items as oxygen-tent, metabolism machine, improved gas machine, and other similar equipment.

For the surgical service 73 beds were utilized, but this number was inadequate for the needs of that department, and in order to meet the requirements patients often had to be transferred or discharged before fully recovered in order to provide for those more urgently requiring care and treatment. During the year 695 surgical cases were admitted, not including cases of a surgical nature that were treated in the venereal ward for concurrent venereal infection. There were 1,307 operations performed in the general surgery section, this excluding surgical procedure in the genito-urinary section, dental clinic, and eye, ear, nose, and throat clinic. At the out-patient office 2,535 operations were performed, mostly of a minor nature, including 1,452 venepunctures. The major operative procedures included 98 appendectomies, 10 amputations, 63 treatment of fractures, 8 thoracoplasties, 9 cystostomies, 117 herniotomies, and 16 miscellaneous laparotomies. In the medical wards 617 patients were treated, including 61 cases of pulmonary tuberculosis. Three insane patients were transferred to State institutions and three to St. Elizabeths Hospital. One tuberculous patient was sent to a State institution and one to a hospital of the Veterans' Administration.

An ample staff of attending specialists and consultants of the highest professional attainments, most of whom are connected with other city hospitals, in conjunction with the services of the resident staff, has been productive of an exceptionally efficient service. In the genito-urinary wards 550 patients were treated, most of whom had venereal infection. There were administered 2,271 injections of nearsphenamine to in-patients and 1,148 to out-patients; 2,324

injections of bismuth to in-patients and 1,199 to out-patients. Seven cases of late syphilis were treated by malaria infection. Spinal puncture was performed in 53 cases. The eye, ear, nose, and throat section gave 1,370 in-patients a total of 7,494 treatments, and 934 out-patients a total of 1,795 treatments; 87 operations were performed, most of a minor character.

The dental officers gave 2,157 patients a total of 16,177 treatments; 565 patients were X rayed, the number of exposures being 2,500; 61 dentures were made, 22 alveolectomies performed. There were 2,218 extractions and 1,160 fillings. Twelve patients with fractured mandibles were treated.

The physiotherapy aides gave 18,531 treatments, 14,705 to in-patients and 3,826 to out-patients. The roentgenologist made 6,678 exposures and 669 fluoroscopic examinations.

The total expenditure amounted to \$326,050.16.

Marine hospital, Boston Mass.—Medical Director A. D. Foster in charge.

There were 1,867 patients admitted to the hospital, classified as follows:

Merchant seamen.....	965	United States Public Health Service.....	40
Coast Guard men.....	573	Lighthouse Service.....	19
Immigrants and alien seamen.....	103	Coast and Geodetic Survey.....	13
Employees' Compensation Commission.....	85	Bureau of Fisheries.....	10
Foreign seamen.....	52	All other beneficiaries.....	7

The average daily number of patients was 156. In the out-patient departments 1,982 physical examinations were made and 1,767 permits were issued for medicinal liquor to be used on board ship.

Of 11 insane beneficiaries, 6 were transferred to native State institutions, 1 was referred to the immigration authorities for disposition, and 4 were sent to St. Elizabeths Hospital. There were 5,292 surgical operations. Röntgenological examinations of 1,972 patients were made, with a total of 5,036 exposures, and 82 patients were given 210 treatments, the majority of the cases being dermatological. In the physiotherapy department 488 patients were given 17,217 treatments. Educational talks on prevention of venereal disease and other subjects pertaining to the health of the individual, illustrated by motion pictures, were given at various times to the patients in the hospital.

The open porches have been inclosed on the first and third floors rear and the second floor side, and with heating and lighting equipment installed, very pleasant recreation and smoking rooms were thus provided. The old isolation ward was remodeled and enlarged into double quarters and is now occupied by the chief pharmacist and administrative assistant. Work on the old cemetery on the hospital reservation has been completed. Numerous trees have been planted and the ground has been graded and grassed.

Several organizations interested in seamen have provided entertainment for the patients at various times. Capt. E. W. Scott, United States Navy chaplain, has continued his work, visiting the patients at the bedside and holding services in the hospital building for them on Sunday afternoons.

Quarters for medical officers now housed off the reservation are needed in the interest of efficiency and economy, and the construction of these quarters, together with a garage for station cars, has been recommended for consideration under the public buildings bill.

The total expenditure amounted to \$247,732.

Marine hospital, Buffalo, N. Y.—Surg. Floyd C. Turner in charge.

This hospital has been kept filled to capacity but without overcrowding, the maximum number of patients being 90. About one-third of the patients are from the Veterans' Administration. Contract hospital facilities are utilized for patients with contagious disease; insane patients are referred to the city hospital for observation and committed from there as necessary. No patients were in the hospital at the end of the year who required domiciliary care but not hospital treatment. The facilities of the New York State Institute for the Study of Malignant Diseases have been freely utilized. The State health department performs Wassermann tests, and the State Hospital for the Care of the Insane has furnished malarial blood for the treatment of patients with cerebrospinal syphilis.

Staff meetings were held weekly. Educational work for patients was continued, four talks being given a month, and literature was distributed.

There are no quarters on the reservation for any of the medical officers. Nurses and attendants formerly quartered in the hospital building have been

removed to provide additional space and now live off the reservation. In the interest of efficiency and economy, the construction of a nurses' home, quarters for 3 medical officers and for 25 attendants, and a garage for station cars has been recommended for consideration under the public buildings bill.

The total expenditure amounted to \$150,513.

*Marine hospital, Carville, La. (the National Leper Home).—*Surg. O. E. Denney in charge.

The number of voluntary admissions has increased and the number of patients leaving without permission has diminished to an almost negligible percentage. The average daily population was 322. The nativity of the 337 patients remaining in the hospital at the end of the year represented 22 States, 5 insular possessions, and 17 foreign countries. Louisiana, Texas, and Florida led this list with an aggregate total of 146 patients. The nativity of the 63 patients admitted during the year represented 13 States and insular possessions and 6 foreign countries. Although 23 patients died, 19 were discharged with disease arrested, and the results of treatment are considered very encouraging.

Additional facilities are needed for the growing requirements. The construction of an infirmary building for 100 bedfast patients is required, as there is no hospital building proper and the cottages are unsatisfactory substitutes. An infirmary building and quarters for officers and other employees now housed in shacks built of salvaged war materials have therefore been recommended for consideration under the public buildings bill.

In view of the general interest in this hospital, the only one of its kind in the United States, the annual report of the station will be published in full in Public Health Reports.

The total expenditure amounted to \$457,343.86.

*Marine hospital, Chicago, Ill.—*Medical Director J. W. Trask in charge.

The facilities of the hospital have been severely taxed to provide necessary medical and surgical relief to service beneficiaries. The rated and normal bed capacity is 150, but there was a daily average of 161 patients, of whom 78 per cent were seamen from American merchant ships. The greatest number in the hospital at one time was 180. In addition to the full-time officers, the hospital has a staff of 15 attending specialists of recognized standing and experience in their various specialties, most of whom are connected with the local medical schools and larger hospitals, and who are available at all times for unusually difficult or serious cases.

The pressing need for dental care of seamen is shown in part by the fact that the hospital dental service in 1929 gave 3,934 treatments; in 1930, 5,817 treatments; and in 1931, 11,952 treatments. The aggregate number of laboratory examinations in 1929 was 8,089, in 1930, 8,827, and in 1931, 9,754. So important in the proper and early diagnosis of conditions has the X ray become that, like clinical laboratory work, it may be taken in a measure as an index of the quality of service rendered. The constantly increasing use of the X ray is shown in the fact that in 1929 there were 2,932 X-ray examinations, in 1930, 3,705, and in 1931, 3,804. The volume of physiotherapy work is limited by the personnel; there were 11,178 treatments this year.

Three insane beneficiaries were given temporary care and then transferred to the custody of the State of their legal residence for continued care in State hospitals for the insane.

By the act of March 4, 1931, \$510,000 was appropriated for a new hospital wing to provide 100 beds, additions to nurses' home and attendants' quarters, and two double houses for medical officers, the construction of which will probably start in the fall.

The total expenditure amounted to \$293,494.55.

*Marine hospital, Cleveland, Ohio.—*Medical Director L. P. H. Bahrenburg in charge.

This report covers the first year's activities of the new hospital, which is located on Fairmount Road, at East One hundred and twenty-fourth Street, on a reservation of 10 acres. The main building is four stories, of steel and concrete construction, with terra-cotta brick facing. It has a capacity of 251 beds, is splendidly arranged for the care of the sick, and is fully provided with modern conveniences and equipment. Bounding a quadrangular court to the south of the hospital are the quarters for personnel and the garages and workshops. The landscaping of the grounds has not yet been completed.

The number of patients has grown with the increased bed capacity. Although usually there is a leeway of about 8 per cent of vacant beds, the hospital has

on several days been filled beyond capacity. The attending specialist in internal medicine holds instructive bedside clinical discussions twice weekly in the wards for the staff, as do also the attending specialists in surgery and orthopedics. The dental unit, the importance and activity of which have greatly increased in all lines, has four chairs of the latest type, with a dental surgeon and two dental internes on duty. Prophylaxis is stressed. There were 2,362 extractions, 1,653 fillings, and 126 dentures made. Thirteen jaw fractures were treated with excellent results. Hospital and out-patients are treated in approximately equal numbers.

The cafeteria for ambulant patients has proved satisfactory beyond expectations. The ration cost averaged 50 $\frac{7}{100}$ cents and ranged between 55 $\frac{8}{100}$ and 45 $\frac{5}{100}$ cents.

In the clinical laboratory a total of 15,506 analyses, tests, etc., were made. Many gastric, blood chemistry, and other special analyses have been required, and tissue work (from operations to autopsies) has been done, partly in collaboration with the National Institute of Health for a check upon results. The demands upon the laboratory have grown to the point of requiring a third laboratorian. With an excellent post-mortem room available (in which is a refrigerator with a capacity of four bodies) and an attending specialist in pathology, a great impetus has been given to the securing of autopsies. There were 74 deaths with 46 post-mortem examinations, a percentage of 62.16. Reckoned from the date when the pathologist was appointed, the percentage is 68.3, due in large part to the interest aroused by his thorough examinations and instructive discussion of the findings.

The physiotherapy section is in charge of a head nurse with special training who is assisted by a male trained aide. The equipment has proved very satisfactory in type and quantity. The following table indicates the extent to which it is utilized:

Treatment	Number of patients treated	Number of treatments given
Massage.....	131	2,096
Electrotherapy.....	91	2,157
Hydrotherapy.....	72	1,129
Thermotherapy.....	412	9,381
Exercise.....	35	890
Total.....	741	15,653

The X-ray laboratory, well equipped for radiography and fluoroscopy, is under the supervision of the attending specialist in röntgenology, who also assists the staff in reading plates. A total of 1,740 patients were examined and 5,198 exposures made.

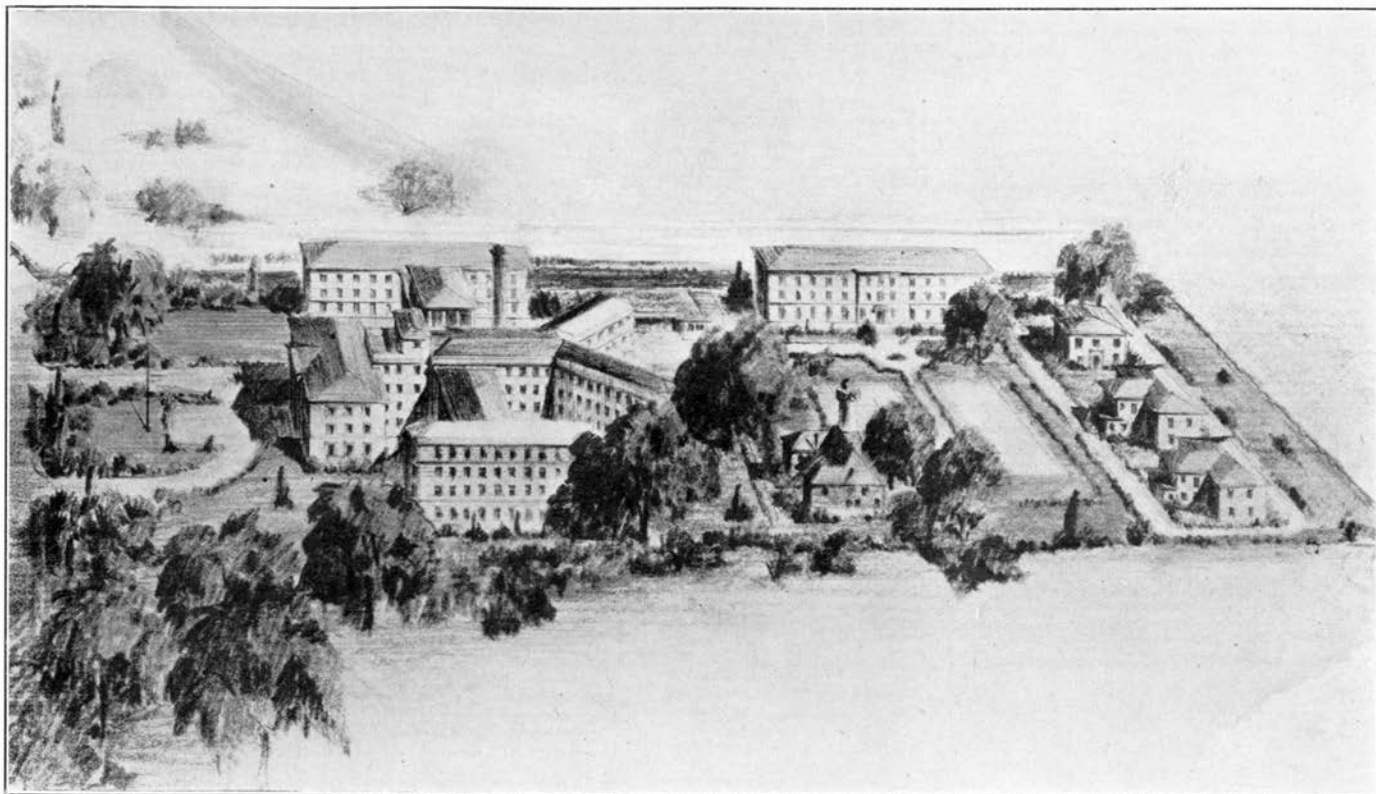
The out-patient office was continued downtown in overcrowded quarters in the Parcel Post Building. Merchant seamen constituted 86 per cent and patients of the Employees' Compensation Commission 10 per cent of the out-patient clientele, although in the hospital, patients of the Veterans' Administration outnumbered all others, as with the opening of the new hospital it became possible to extend larger facilities to this class of patients. One hundred beds were allocated for their use, and this number was later increased. The maximum number of veterans was 205 on June 27, 1931.

A number of patients with permanent disabilities (one insane) were discharged to the custody of their families, being no longer in need of hospital care. Three tuberculous patients were transferred to Fort Stanton.

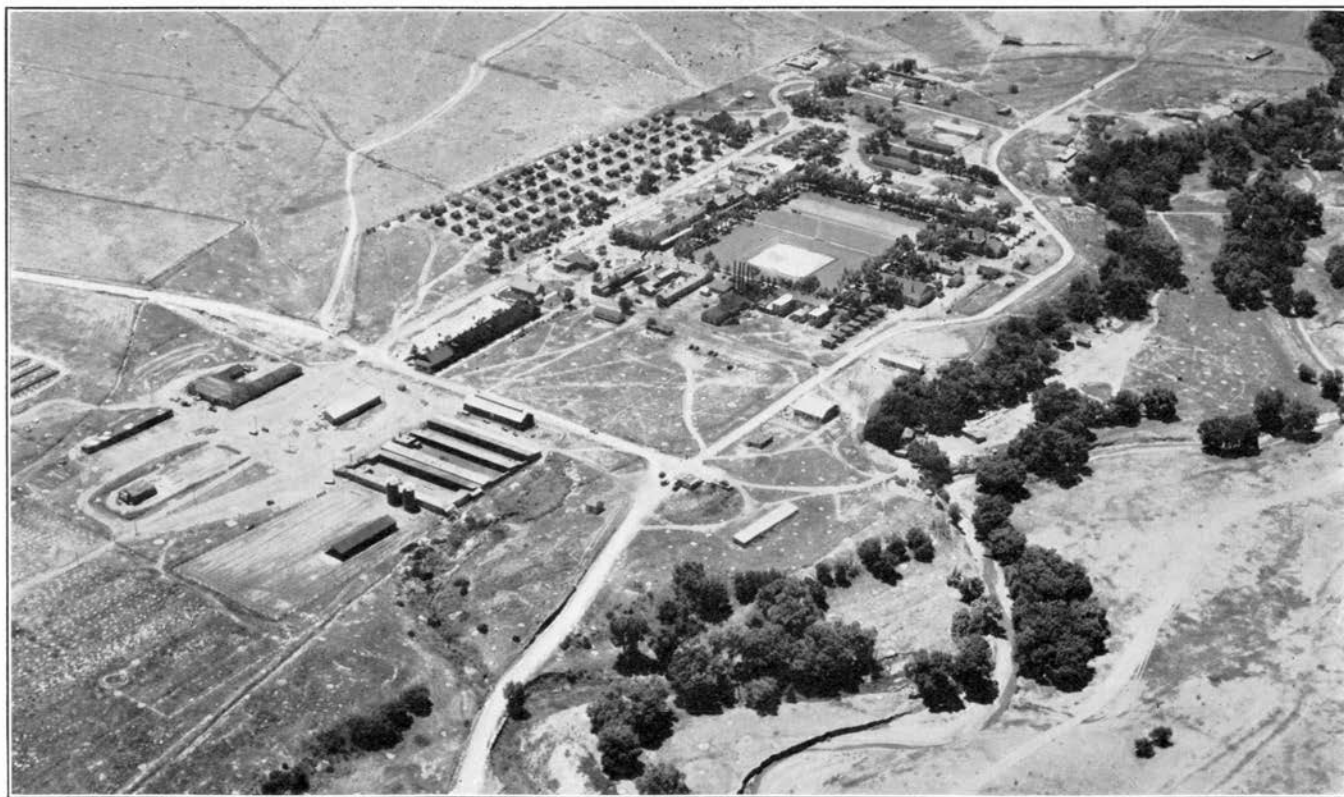
The total expenditure amounted to \$329,412.21.

Marine hospital, Detroit, Mich.—Surg. J. H. Linson in charge.

The new hospital at Windmill Pointe was kept filled to capacity during this year, the first complete year of its operation, and during the winter months it was necessary to put beds in ward aisles and to place several patients in a contract hospital. The smallest number of patients in the hospital was 108 on March 8, and the greatest number was 148 on January 22, considerably above the normal capacity. Slightly more than half the hospital patients and 78 per cent of the out-patients were merchant seamen; 40 per cent of the



UNITED STATES MARINE HOSPITAL, DETROIT, MICH., COMPLETION OF WHICH WAS AUTHORIZED BY THE ACT OF JULY 3, 1930



246-2

UNITED STATES MARINE HOSPITAL FOR TUBERCULOUS PATIENTS, FORT STANTON, N. MEX.

hospital patients were veterans of the World War. There were 11,150 dental treatments, of which 43 per cent were for out-patients; 2,325 injections were given for treatment of syphilis and 21,924 physiotherapy treatments for general medical and surgical cases. The hospital is handicapped by an insufficient number of private rooms for seriously ill patients.

A contract to draw plans for the additional wing, nurses' quarters, attendants' quarters, laundry, and medical officers' quarters has been awarded to a local firm of architects. (See cut of architects' sketch.) It is proposed to increase the capacity to 250 patients. Negotiations for additional land for the hospital grounds were carried on, but the owner refused to sell at the public appraisal and condemnation proceedings were instituted by the district attorney. The department of public works of the city of Detroit was permitted to fill in the submerged area of the present reservation almost to the harbor line.

Two mildly insane patients were released to the custody of their relatives, 2 were assisted to enter the Wayne County Home for the Poor at Eloise, Mich., 1 was sent to the State hospital at Ann Arbor, and 1, a veteran, was transferred to the veterans' hospital at Camp Custer, Mich.

The total expenditure amounted to \$200,380.47.

Marine hospital, Ellis Island, N. Y.—Medical Director C. H. Lavinder in charge.

The capacity of the hospital was overtaxed during the winter months, necessitating a ward at Hoffman Island, where, with the cooperation of the quarantine station, a group of patients was maintained from January 24 to May 20, 1931. American seamen now greatly outnumber other classes, and only 793 immigrants, 1,251 warrant cases, and 431 alien seamen were treated this year. The reimbursements deposited in the General Treasury for the care of aliens amounted to a considerable sum. The increased demands on this hospital are shown in the following comparative statement:

Year	Total number of days' treatment	Daily average number of patients in hospital
1927	121,793	333
1928	128,950	352
1929	141,076	386
1930	144,244	395
1931	163,779	448

Staff conferences are held at regular intervals and programs are presented under the guidance of a committee. Educational work for beneficiaries was also continued, and a weekly talk was given with moving pictures, the average attendance at which was about 300. A cafeteria was installed with modern equipment, particularly for genito-urinary patients, and a special X-ray and fluoroscopic unit was purchased for the tuberculosis section, where there are constantly more than 100 patients; 410 pneumothorax treatments were given here. The Immigration Service plans further improvements to the hospital, and an expenditure of about \$120,000 in renovating the electric light and power service, exterior and interior painting, reconstruction of bridge between Islands No. 2 and No. 3, and repairs to roofs and plumbing.

The social service department is coordinated with that of the marine hospital on Hudson Street and is represented in the Welfare Council of New York City. Funds were donated by the auxiliary composed of local citizens. Convalescent care was secured for 135 seamen, whose discharge from hospital was thus expedited; 94 seamen were returned to home ports, permanent care was obtained for 10 patients, and the discharge of 25 other chronic patients was arranged; 235 patients were financially assisted and 152 other patients referred to agencies providing temporary shelter, all in the interests of facilitating discharge or avoiding the necessity of admitting seamen to hospital. Friendly aid was given to 1,847 patients in matters of baggage, wages, and the like, and clothing was furnished to 219 patients. A volunteer worker is in charge of the library. Recreational facilities were provided, including motion-picture shows once each week. Patients' visitors were received numbering 16,024 and 2,440 passes were issued under medical direction. The following is a partial

list of agencies contributing to the recreational welfare of patients at this hospital:

American Red Cross.
New York Film Board of Trade.
Cheer Givers.
Toc-H-Men.

Roxy's Theater.
Immigration Social Service Workers.
Seamen's Church Institute.
New York Plant and Flower Guild.

The following is a brief statistical summary of transactions of the year:

Patients treated.....	5,851	Dental treatments.....	21,854
Deaths.....	125	Physiotherapy treatments.....	11,058
Autopsies.....	74	Occupational therapy treat- ments.....	3,572
Average stay in hospital (days).....	28	X-ray exposures.....	8,999
Average per diem cost.....	4.55	Laboratory examinations.....	34,189
Average ration cost.....	\$0.567		

The total expenditure amounted to \$748,614.33.

Marine hospital, Evansville, Ind.—Surg. K. E. Miller in charge.

The average number of patients in this hospital was 70, the minimum 61, and the maximum 77. More than one-half were patients of the Veterans' Administration. An additional hospital building is needed to increase the capacity and improve the facilities, and to this end \$100,000 was appropriated by the act of March 4, 1931. The reservation of 10 acres is of ample size. Plans for the new building are in course of preparation by the Supervising Architect, and it is anticipated that construction will begin this fall.

The total expenditure amounted to \$75,062.49.

Marine hospital for tuberculosis, Fort Stanton, N. Mex.—Surg. R. L. Allen in charge.

Of 375 patients treated, 304 were merchant seamen, 20 Coast Guard men, 9 beneficiaries of the Employees' Compensation Commission, 10 civilians from the United States Army Engineer Corps, and the remainder other classes of beneficiaries. The daily average was 248 and the maximum number of patients 261. The average stay of patients discharged, including those who died, was 632 days. It is the policy to encourage all patients to remain until either restored to working capacity or death ensues, but transfers to other marine hospitals are made if necessary for the patients' comfort. There were 23 deaths from tuberculosis and 18 necropsies. One patient was murdered by another patient. Of 84 tuberculous patients who were discharged, 34 were not improved, 31 were improved, and in 19 the disease was apparently arrested.

Phrenic surgery and pneumothorax treatments were continued, with good results, 26 phrenicotomies and 970 fills and refills were done. A dental officer and dental assistant gave 3,088 treatments, including 450 fillings, 279 extractions, and 18 dentures. Nine hundred and seventy-one ultra-violet light treatments were given, and natural heliotherapy was continued with good results. The X-ray work continues to increase in importance. Systematic periodic X-ray examinations are made and compared with previous readings and physical examinations to note the progress made. All pneumothorax cases are checked with fluoroscopic and plate examination at frequent intervals. There were 661 films of the chest and 125 fluoroscopic examinations made.

One technician does the clinical laboratory work under the supervision of a medical officer. Two student technicians from among the patients have served without pay, either of whom could now carry on the routine laboratory work if called upon to do so. The opinion expressed in last year's report of the value of the erythrocyte sedimentation test has been strengthened. Butler and Kahn tests are performed on all patients admitted to the hospital. A total of 6,113 laboratory tests of all kinds were made.

The bakery has been rearranged and the oven rebuilt. Modern cafeteria equipment was installed in the ambulant mess, and the system is working out very satisfactorily; the ration cost has decreased slightly and the patients receive warmer and more attractively served food than formerly. The purchase of canned fruit and vegetables and potatoes in carload lots has also reduced the cost of supplies.

The occupational therapy department employs three aides and a storekeeper. The craft shop was painted and decorated by the patients. It has 1 large room, which is used for weaving, leather work, and decorative art, 1 small room for show card and sign painting, and 1 for wood and metal work. Ninety-five patients took occupational therapy and 46 educational therapy, an aggregate total of 16,882 hours. Much is done for patients besides the educational and

occupational work, as patients, due to their prolonged illness and loneliness, become discouraged. Magazines and books were contributed to the library, the greatest source of diversion. All hospital beds are equipped with earphones and the radio program is continuous from 6 to 9 p. m. The Trowel Club employs a radio operator and furnishes diversified entertainment throughout the year, such as plays and musical programs, and distributes cigarettes and tobacco. The Seamen's Social Club has distributed cigarettes, tobacco, and razor blades weekly to all patients, with funds contributed by various steamship companies. The Seamen's Church Institute operates the Community House and contributes generously to welfare activities. A good baseball team was maintained. Two motion pictures are shown each week, and musical programs, parties and picnics for patients have been well attended. A Catholic and a Protestant chaplain have been maintained on the station by their respective organizations and conduct religious services and administer to the spiritual needs of the sick and dying.

The pipe line froze on two occasions, necessitating large emergency expenditures for labor to restore service and causing serious water shortage. Plans for repair of the line are now being prepared by the Supervising Architect's Office. Livestock water supply was greatly improved by the drilling of two deep wells in pasture remote from water. One in section No. 28 has been equipped with a windmill and pump and is providing a plentiful supply of water. The other well, in section No. 33, will be in service early in the next fiscal year. The dam constructed by the Southern Pacific Railroad Co., located approximately 16 miles above the station proper, was completed and filled in May, 1931. The effect of this dam upon station water supply can not be determined at this time.

Production of milk in the dairy has been ample for all requirements. All beef and pork used was produced on the station.

Since the old Army hospital burned in 1905, the old cavalry barracks have been used as an infirmary and these are unsatisfactory. A new hospital building is needed and a number of 2-bed shacks are also required to replace dilapidated structures. The construction of an additional hospital building of 50 beds, 30 two-bed frame shacks, a nurses' home, quarters for 4 medical officers, and a new power plant and laundry building, has been recommended.

The total expenditure amounted to \$358,341.29.

Marine hospital, Key West, Fla.—Surg. M. S. Lombard in charge.

It was necessary to restrict admissions to this hospital to prevent overcrowding, and a waiting list was maintained for patients of the Veterans' Administration, who constitute the majority of the clientele. During fall and winter months, a large number of old-line beneficiaries come from considerable distances to apply for admission. The average number of patients in hospital was 88, and the maximum was 98 on February 21, 1931. There were 329 major and 1,033 minor surgical operations, 3,520 surgical dressings, 3,595 clinical laboratory examinations, and 1,542 X-ray exposures. Spinal anesthesia was used for operations below the diaphragm, and local or ether anesthesia for other work or at the request of patients.

Through the courtesy of the Navy the hospital communicated by radio with 38 ships, exchanged 107 messages, and admitted 14 patients who were transferred from passing ships at sea to commercial boats sent out for the purpose and conveyed to this port. The Army and naval hospitals being closed, several officers and enlisted men on duty in or near Key West were given medical care.

Although all rain water is saved and used, it was necessary to continue to purchase distilled water from the navy yard, no other sources of fresh water being available on the island. To the end of the fiscal year salt water for flushing purposes was purchased from the city of Key West, but during the month of June, 1931, the station's salt-water equipment, consisting of a 65-foot well, a 2,000-gallon tank, and three pumps, was reconditioned and again placed in operation, and now supplies salt water for fire-control and for flushing purposes. The triangular plot of land adjoining the hospital was leased from the Navy Department and graded and planted with shrubs, trees, and Bermuda grass, as was also the ground west of the marine hospital buildings that was acquired through the courtesy of the Navy. A tennis court was built with station labor. A fence was erected along the newly established boundary lines and incloses the entire reservation, the general

appearance of which was thus greatly improved. The supervising architect has completed plans for the addition to the hospital for which \$25,000 was appropriated by the act of July 3, 1930, and construction work will begin shortly.

The total expenditure amounted to \$129,285.30.

Marine hospital, Louisville, Ky.—Surg. Joseph Bolten in charge.

This hospital, with a bed capacity of 83, cares for seamen of the Ohio and tributary rivers, beneficiaries of the Employees' Compensation Commission, patients of the Veterans' Administration, and other beneficiaries. The out-patient office in the customhouse remained closed; all out-patients were cared for at the hospital. A large number of patients, especially veterans, applied for admission to the hospital. The maximum number under treatment was 99 on May 30, 1931. Nine attending specialists representing the various specialties supplement the full-time hospital staff. The attending specialist in surgery examined 679 patients and operated upon 162.

The hospital is indebted to the University of Kentucky for blood examinations; this arrangement is very satisfactory, the reports being returned three days after the specimens are forwarded. Both the Wassermann and Kahn precipitation tests are made from each specimen, of which there were 874. The contract for X-ray work has been continued for difficult cases requiring expert interpretation. Three patients have also been treated with radium by contract, receiving 6,800 milligram-hours, and 9 patients were given 58 deep X-ray therapy treatments during the year.

The city park commission planted eight shade trees and the grounds were further beautified by the addition of a considerable amount of shrubbery received from friends and by the planting of 250 coniferous trees.

The home service of the Louisville Chapter of the American Red Cross aids the patients in many social problems. A religious service is conducted each week by various ministers at the invitation of the Young Men's Christian Association and recreation is provided for ambulatory patients by a number of local agencies.

By the act of March 4, 1931, \$460,000 was appropriated for a new hospital building and conversion of the old building into quarters for officers, nurses, and personnel. The architect is drawing the plans for this hospital and construction will probably start in the fall.

The total expenditure amounted to \$113,633.90.

Marine hospital, Memphis, Tenn.—Surg. W. H. Slaughter in charge.

This hospital was kept filled beyond the normal bed capacity of 65; at one time there were 85 patients and beds were placed on the porches and in corridors. The professional work continued to increase; 1,417 surgical operations were performed, 1,721 clinical laboratory tests made, and 588 exposures were made in the X-ray clinic. Wassermann tests were performed on all patients admitted to the hospital. All tissue removed at operations was submitted as a routine procedure to the National Institute of Health for histopathological examination. One patient not in need of hospital treatment and requiring only custodial care was diverted to a local public institution. The duties of dietitian were performed by the acting chief nurse in addition to her other functions. The out-patient office was operated at the hospital.

Considerable new equipment was installed during the year, including furniture for wards and nurses' quarters, a truck, and complete new X-ray apparatus. A new hospital building is urgently needed to replace the present dilapidated buildings, and an appropriation of \$175,000 is available for this purpose.

The total expenditure amounted to \$103,954.49.

Marine hospital, Mobile, Ala.—Surg. W. S. Bean in charge.

Although Mobile in common with other ports has felt the world-wide depression in shipping, only 773 vessels having entered at the customhouse, the smallest number since 1924-25, when 737 entered, the hospital has been filled at all times. There was a daily average of 94 patients, although the normal capacity is only 90. Of the 849 patients treated in the hospital, 523 were merchant seamen. As in other years, patients of the Veterans' Administration were admitted only when the beds were not needed for seamen. There were 20 deaths and 11 autopsies.

As is customary, the bulk of the considerable surgery has been done by the consultants in general and orthopedic surgery. The dental work has increased; 9,252 treatments were rendered. The physiotherapy aide gave 7,980 treatments.

Two of the nurses were operated upon for acute appendicitis, and one suffered a severe injury, sustaining multiple fractures of the pelvis. The appendicitis cases made prompt recoveries and the fracture case was greatly improved at the



UNITED STATES MARINE HOSPITAL, GALVESTON, TEX.



UNITED STATES MARINE HOSPITAL, NEW ORLEANS, LA.



UNITED STATES MARINE HOSPITAL, SEATTLE, WASH., TO BE COMPLETED
IN 1932

end of the year though not yet ready for return to duty. As in the past, the dietetic service has been under the acting chief nurse with the immediate supervision of a housekeeper. The clinical laboratorian secured in March, 1930, has made 10,958 examinations. The laboratory can now do any ordinary type of clinical work required. The work in the X-ray department under a part-time laboratorian in röntgenology has increased greatly during the year, due largely to the examination of Veterans' Administration claimants for compensability. There were some additions to the equipment. A total of 1,541 exposures were made on 745 patients. In the dispensary 1,891 prescriptions were filled for out-patients and 820 for hospital patients.

Brass water piping was installed throughout the hospital building to replace the galvanized pipes, which had become so occluded that at times it was practically impossible to get sufficient water to various parts of the building. There is now an adequate supply of hot and cold water with sufficient pressure at all times. A new closed passenger car was delivered to the station on August 21, 1930, and a new truck was bought.

An act approved March 4, 1931, appropriated \$450,000 for new buildings. The work authorized will enlarge the hospital to 190 beds and provide a heating plant, a garage, a home for 30 nurses, and quarters for 4 medical officers. Plans are in preparation and construction will probably begin this fall.

The total expenditure amounted to \$133,574.

Marine hospital, New Orleans, La.—Surg. T. B. H. Anderson in charge.

This hospital has continued to function at maximum capacity during the past year, and the standard of professional service was satisfactory in spite of administrative difficulties due to construction of the new hospital. Several buildings were moved by station labor without interference with the operation of the hospital, to clear the site for the erection of quarters. Educational lectures on hygiene, in most instances illustrated, have been given to ambulatory patients weekly. Staff meetings have been held weekly. The Orleans Parish Medical Society and the First and Second District Dental Societies again held a joint meeting with the staff of this hospital. Twenty medical and four dental internes were given a thorough course of instruction. Of these eight of the medical and two of the dental internes received commissions in the service. The internes as a group gave very satisfactory service.

The out-patient office at the customhouse building was moved to larger and better quarters in the same building.

Fourteen insane patients were discharged to State or city or Veterans' Administration hospitals and only one was sent to St. Elizabeths Hospital.

The following is a summary of transactions for the year:

Hospital patients treated.....	5, 001
Hospital days.....	141, 497
Deaths.....	123
Autopsies (62 per cent).....	74
Operations, surgical operating room.....	819
Doses of salvarsan.....	3, 771
Spinal punctures.....	225
Operative procedures (urological service).....	4, 815
Treatments (eye, ear, nose, and throat clinic).....	10, 077
Operations (eye, ear, nose, and throat clinic).....	326
Refractions (eye, ear, nose, and throat clinic).....	192
Treatments (dental clinic).....	40, 619
Examinations (dental clinic).....	5, 632
Treatments (physiotherapy department).....	11, 460
Examinations (clinical laboratory).....	52, 536
Exposures (röntgenology department).....	9, 077
Treatments (röntgenology department).....	1, 090
Consultations with consultants.....	3, 066
Out-patient treatments (customhouse) : Medical, 13,352; dental, 9,640.....	22, 992
Out-patient examinations.....	3, 977
Number of liquor permits issued.....	178
Number of ship crew examinations.....	1, 368

Construction of the new hospital was began in July, 1930, and it is thought that the hospital will be ready for occupancy by November, 1931. (See cut of architect's sketch.) Construction of quarters for personnel was begun in March, 1931, and these will probably be completed by January, 1932.

The total expenditure amounted to \$484,315.98.

Marine hospital, New York, N. Y.—Surg. P. M. Stewart in charge.

In addition to the station at 67 Hudson Street, out-patient offices are operated at the barge office and the main post-office building; medicinal liquor permits for ships are also issued in the customhouse. A continued increase in work was accomplished without increase in personnel. New equipment included an X-ray machine of valve tube type rectification, a new electro-treatment machine in the skin clinic, a dental X-ray machine, additional deep therapy lamps for physiotherapy, and a photometer for more rapid and accurate refraction. A rearrangement of floor space adjoining the laboratory, supplies an additional room for physiotherapy. Space for dark field laboratory work was obtained by inclosing a portion of the unused hallway. The cold-water pipes throughout the entire building were replaced with brass pipe and improvements in the lavatory facilities were made. Specially designed wash-up sinks for patients were installed in the genito-urinary clinic. To provide adequate compressed air for the dental clinic the usual type dental air compressors were replaced by a large-size commercial compressor.

The number of patients treated during the year and the treatments rendered showed an increase over preceding years. The following is a summary and comparative schedule of the work during the past two years:

	1930	1931
New cases admitted.....	20,318	21,029
Physical examinations.....	20,186	16,054
Operations.....	4,256	5,252
Anti-syphilitic injections.....	12,997	8,668
Total number treatments.....	170,062	178,642
Maximum treatments in one day.....	771	769
Average daily treatments.....	566	595
X-ray exposures.....	26,846	22,709
X-ray treatments.....	530	1,479
Clinical laboratory examinations.....	14,069	13,054

Two patients were assisted to obtain entrance to Sailors' Snug Harbor.

Marine hospital, Norfolk, Va.—Surg. S. L. Christian in charge.

The maximum amount of hospital care was provided and an increase can not be effected until the new hospital is built. The rated capacity of the hospital, 217 beds, was frequently exceeded; the greatest number of patients was 249, on February 24, 1931. The principal beneficiaries were 1,284 merchant seamen, 206 Coast Guard men, 146 patients of the Employees' Compensation Commission, and 703 patients of the Veterans' Administration. There were 79 deaths and 46 autopsies. Attendance at autopsies and weekly staff meetings is required of all officers. The staff again furnished a program for Public Health Service night at the medical society, and in October and June gave clinic programs at the hospital for the benefit of the Old Dominion Medical Society (colored) which were attended by about 75 members.

Of 4 insane patients, 3 were transferred as citizens to a State hospital and only 1 to St. Elizabeths Hospital as a service obligation. Of 6 patients requiring domiciliary care but not in need of hospital treatment, 4 were sent to the City Home in Norfolk and 2 to a national soldiers' home. Four tuberculous patients with dual eligibility were transferred to a sanatorium of the Veterans' Administration. There were 2,386 intravenous injections for syphilis, 13,936 clinical laboratory examinations, 28,251 physiotherapy treatments, and 7,062 X-ray exposures; 583 in-patients and 937 out-patients were furnished an aggregate of 10,926 dental treatments. Additional oxygen-therapy apparatus, a gas machine for the operating room, an X-ray beside unit, and a new ambulance were purchased. An officer with special training in pathology and bacteriology was added to the staff. The chaplain held devotional services, provided 20 entertainments, and continued to provide proper religious services and supervise all interments.

All the hospital buildings were painted inside and out, all roads were widened 4 feet, the bathrooms in the nurses' home and the hospital kitchen and dining room were tiled, and additional fire escapes were erected. Plans are in preparation for an additional wing designed to increase the capacity of the hospital to 400 beds and for additional quarters for which an appropriation of \$800,000 was made by the act of March 4, 1931 (second deficiency act). It is anticipated that construction will be started late in the fall of 1931.

The total expenditure amounted to \$374,567.18.

Marine hospital, Pittsburgh, Pa.—Surg. Ralph E. Porter in charge.

Many physical improvements were made in this hospital. The street through the reservation was closed and a fence is under construction between the hospital property and Arsenal Park. The kitchen was furnished with modern equipment. Two new verandas were completed and put into use; the one on the first floor is used as a ward, increasing the bed capacity of the hospital from 82 to 92, and the one on the second floor is used as a recreation room. The roof of the veranda is used as recreation space for the third floor. The exterior wood and ironwork of the hospital has been painted. A nose and throat room has been equipped on the first floor. Electric water coolers for the second and third floors and furnishings for the verandas were presented by local welfare organizations. A consulting ophthalmologist was added to the staff. There were 3,825 dental treatments, 6,255 physiotherapy treatments, and 3,222 surgical operations. Seventy per cent of the hospital patients are Veterans' Administration beneficiaries.

There are no quarters on the reservation for any of the medical officers. Nurses and attendants formerly housed in the hospital building have been removed to provide additional ward space and are quartered off the reservation. In the interest of efficiency and economy, the construction of a nurses' home and quarters for 3 medical officers and 25 attendants has been recommended for consideration under the public buildings bill.

The total expenditure amounted to \$147,008.80.

Marine hospital, Portland, Me.—Senior Surg. J. R. Ridlon in charge.

The hospital was filled to capacity during the year. Fifty-five per cent of the patients were beneficiaries of the Veterans' Administration, 23 per cent were American merchant seamen, 14 per cent were Coast Guard personnel, and the others represented other classes of beneficiaries. Competent consultants were attached to the staff and freely used in their specialties. Including those remaining from the preceding year, 855 patients were furnished 26,715 days' hospital relief. Out-patient treatments numbered 5,238, and out-patient examinations 390. There were 1,021 surgical operations, 5,643 physiotherapy treatments, 4,424 laboratory examinations, and 1,890 X-ray exposures.

New construction is needed to provide increased facilities for patients and quarters for personnel, garage, power house, storage, and mortuary.

Numerous welfare and service organizations have furnished entertainments and some luxuries to patients.

There are no quarters on this reservation for any of the medical officers. Nurses and attendants formerly quartered in the hospital building have been removed to provide additional ward space and are now housed off the reservation. In the interest of efficiency and economy, the construction of a nurses' home and quarters for 3 medical officers and 15 attendants has been recommended for consideration under the public buildings bill. A new heating plant and a garage for station cars are also included in these requirements.

The total expenditure amounted to \$119,695.

Marine hospital, Port Townsend, Wash.—Surg. O. H. Cox in charge.

Located 50 miles from Seattle whence all patients are received, this hospital of 100 beds was kept constantly filled and an average of 12 patients maintained in a contract hospital. Two tuberculous patients were transferred to Fort Stanton. There were 26 deaths and 15 autopsies; 874 surgical operations were performed, including 67 appendectomies, 107 for repair of hernia, 9 gastroenterostomies, 4 nephrectomies, and 99 tonsillectomies. Ether was used only three times. For a quick general anesthetic, ethyl chloride was used thirty-five times. For the other cases, spinal, caudal-sacral, regional, or local procaine injection was used according to the indications.

The total expenditure amounted to \$123,777.59.

Marine hospital, St. Louis, Mo.—Medical Director F. H. McKeon in charge.

The need of a new marine hospital at St. Louis has become increasingly apparent. The Veterans' Administration continues to avail itself of the 30 beds allocated for the treatment of its beneficiaries. Patients of the Employees' Compensation Commission are being treated in increasing numbers and the number of old-line beneficiaries hospitalized becomes larger each year. There were performed 1,205 surgical operations, an increase of 430 over the preceding fiscal year; 1,359 X-ray examinations were made, an increase of 286, and the clinical laboratory made 3,286 examinations, or 1,000 more than in 1930.

Complete new X-ray equipment, including a Bucky table, has been installed, and excellent work in all branches of radiology is done. The out-patient office was removed from the old customhouse to the hospital. The new arrangement is highly satisfactory to all concerned.

The number of days' relief furnished was 32,569, divided among the various classes of beneficiaries as follows:

Merchant seamen.....	9,244
United States Engineer Corps.....	8,863
Mississippi River Commission.....	365
Employees' Compensation Commission.....	3,021
Veterans' Administration.....	10,789
Miscellaneous.....	91

To improve facilities and reduce the alarming fire hazards, due to the use of ward buildings of inflammable type, the construction of a ward building of 100 beds has been recommended for consideration under the public buildings bill.

The total expenditure amounted to \$140,097.32.

Marine hospital, San Francisco, Calif.—Medical Director M. J. White in charge.

Ground was broken for the new hospital on April 7, 1930, and the cornerstone was laid October 23, 1930. On June 30, 1931, the builders expected to have the new hospital building completed by August 15. Work was commenced on the nurses' quarters on December 4, 1930, and that building was about 80 per cent completed on June 30, 1931.

Four sailors were assisted in obtaining entrance to Sailors' Snug Harbor, and there are no other patients in the hospital at present who are eligible for admission thereto. Of the chronic patients undergoing treatment, all are in need of hospitalization, and there is none requiring custodial care only. One chronic patient was sent to the State institution for the blind and one to the Veterans' Home. Ninety-eight tuberculous patients were admitted to hospital, of whom thirteen were transferred to Fort Stanton. There were 94 deaths from all causes and 46 autopsies.

Through Army courtesy the hospital has been supplied since September, 1930, with water from the Presidio reservoir at a cost of about \$160 per month, whereas water formerly purchased from the city cost about \$800 per month. The Presidio water pressure is ample to supply the new hospital building without the use of booster pumps.

The Seamen's Church Institute has continued its very helpful work for the hospital.

The original act for the construction of the new hospital building was amended by the act of March 4, 1931, to provide for the construction of additional officers' quarters, a laboratory building, a recreation building, a storehouse, and a garage. Plans for these buildings are now in course of preparation.

The total expenditure amounted to \$502,647.53.

Marine hospital, Savannah, Ga.—Medical Director J. T. Burkhalter in charge.

The following is a comparative table showing activities for the fiscal years 1930 and 1931:

Item	1930	1931
Number of days relief furnished in-patients.....	58,188	59,190
Physical examinations.....	1,743	2,202
Out-patient treatments.....	6,967	8,834
Dental treatments and examinations.....	6,645	10,977
Laboratory examinations.....	14,911	20,561
X-ray examinations.....	3,152	4,421
Surgical operations.....	4,034	5,475
Physiotherapy treatments.....	10,701	16,997

There were 46 deaths and 11 autopsies.

A considerable amount of new equipment was added, the most important of which consisted of complete equipment for an eye, ear, nose, and throat clinic at a cost of approximately \$1,500; one high-frequency diathermy outfit and one electric vibrator, professional model, mounted on floor stand, at a cost of \$355.50; and one motorless oxygen-therapy apparatus at a cost of \$400.

The outstanding improvements to the building were the erection of three sun porches on the south side of the hospital annex, painting the exterior of the annex, changing casement type windows to double-hung sash windows in laboratory and main kitchen, installation of a new dumb-waiter for subsistence supplies and patients' trays, and an additional toilet and bathroom for tuberculous patients. A contract was also awarded by the Supervising Architect's office in

amount of \$12,300 for enlarging and remodeling the hospital; this work includes the enlarging of dental clinic and diet kitchen, provides three nurses' offices, two privates rooms with bath, and tile wainscoting in the main kitchen.

The total expenditure amounted to \$228,463.13.

Marine hospital, Stapleton, N. Y.—Medical Director M. H. Foster in charge.

Filled always to capacity, this hospital sends its overflow of patients to Ellis Island and Hoffman Island, an unsatisfactory arrangement that must be continued until the new hospital is built.

Of the 3,785 in-patients, 2,813, or 74.5 per cent, were merchant seamen; 572, or 15.4 per cent, members of the Coast Guard; and 137, or 3.6 per cent, beneficiaries of the Employees' Compensation Commission. Other classes of beneficiaries were admitted in smaller numbers. There were 3,129 surgical operations, which included 125 appendectomies and 441 inguinal herniotomies. Four hundred and sixty-three patients received spinal anesthesia, 428 were given nitrous oxide or ethylene, and 115 had ether. Sixteen individuals were operated upon under rectal ether, and 144 operations were performed under novocaine. Approximately 72 per cent of all patients admitted to the hospital were sent to the surgical wards, and 29 per cent of the deaths occurred in the surgical section; 11 of these died from malignancy, 8 of whom were never operated upon. There were in all 91 deaths and 38 necropsies. The professional facilities were improved by new equipment, including a urological examining table with X-ray generator, an electric cardiograph, a gas-oxygen apparatus, emergency lighting system for the operating room, new fracture beds, a complete outfit of new splints, and new bakers of the wire-coil electrically heated type.

There were 3,802 dental examinations and 20,595 dental treatments, a large number of which were furnished to the personnel of the Coast Guard. The dental department also performed 1,741 extractions and attended 52 fractures of the jaw. The physiotherapy department rendered 35,057 treatments to 1,116 patients. The X-ray department made 10,283 exposures, of which 922 were of the chest and 432 of the gastrointestinal and uro-genital tracts; 579 superficial and deep X-ray treatments were administered. A number of patients were transferred from other stations to receive deep X-ray therapy. There were 22,620 clinical laboratory examinations, including 3,430 complement fixation examinations for syphilis, 286 routine gastric analyses and 28 special gastric analyses, 136 spinal Wassermann reactions, and 276 tissue examinations.

During the entire winter the station furnished a medical officer to make evening sick call and weekly sanitary inspection on board the shelter ship *Broadway*, a floating home for destitute seamen which was maintained by the Salvation Army and anchored near the hospital. Prisoners from the Federal prison camp, Department of Justice, located at Fort Wadsworth, Staten Island, have been receiving treatment at this station in line with recent legislation. A dental office and laboratory were equipped by the Service at Coast Guard Base No. 2, located about one-half mile from the hospital and a dental officer is detailed thereto. This saves a large amount of time for Coast Guard personnel and is advantageous to all concerned. Animal experimentation studies of syphilis were continued.

Title to the parcels of additional land needed for new construction has been acquired, and the reservation now extends to Vanderbilt Avenue on the south and Tompkins Avenue on the west. Plans for the new buildings are well under way, and it is anticipated that construction will begin this fall.

The total expenditure amounted to \$452,189.58.

Marine hospital, Vineyard Haven, Mass.—Passed Asst. Surg. Frank F. Thweatt, jr. in charge.

This general hospital, opened in 1879, has a capacity of 24 beds, but during the past winter as many as 40 patients were cared for on more than one occasion. In addition to merchant seamen, patients are received from 1 Coast Guard base, 5 life-saving stations, 6 lighthouses, and 4 light vessels, and occasionally from the Employees' Compensation Commission and the Veterans' Administration.

By a rearrangement of facilities and the purchase of new equipment the hospital has been improved. Repairs and alterations were made to the first and second floors of the hospital building, as a result of which a new 4-bed ward for tuberculous patients and a new operating room were secured. The latter is newly equipped with light and electrical sterilizers. A new combination truck and ambulance was received shortly before the end of the fiscal year.

The total expenditure amounted to \$43,301.37.

Relief station, Cairo, Ill.—Acting Asst. Surg. R. E. Barrows in charge.

The marine hospital in this city remains closed. It was closed to patients in 1914 and reopened in 1919 for about five months. Quarters are furnished at the hospital to the medical officer in charge and the caretaker, without expense to the Government for fuel, electricity, gas, or water. The hospital grounds present a neat appearance, the grass is kept mowed, driveways free from weeds, and trees and shrubbery trimmed.

During the year 266 merchant seamen, 103 patients of the Engineer Corps of the Army, and 90 beneficiaries of the Employees' Compensation Commission were treated, and 30 members of the Coast and Geodetic Survey party were inoculated against typhoid fever.

Several barge lines are now operating on the Ohio River. The Federal Barge Line has one of its largest terminals at Cairo and during the winter is the northern terminal on account of ice in the Mississippi River north of Cairo.

Relief station, Galveston, Tex.—Acting Asst. Surg. E. M. F. Stephen in charge.

Five rooms in the customhouse are set apart for the out-patient office, where medicinal liquor permits, narcotic permits, and port sanitary statements are issued to vessels. Six hundred and seventy patients were treated in the contract hospital and 2,973 as out-patients.

The marine hospital is nearing completion, equipment is arriving daily, and the buildings will be ready for occupancy about September 15, 1931. The hospital site consists of four city blocks near the center of the city, about midway between the Gulf and the Bay. It is near the best residential section of the city, the location giving assurance that no objectionable construction from a hospital viewpoint is to be anticipated.

The original act for the construction of the new hospital was amended by the act of March 4, 1931, to provide for the construction of additional quarters and a recreation building, plans for which are now in course of preparation.

Relief station, Honolulu, Hawaii.—Medical Director S. B. Grubbs in charge.

Honolulu is the only place in the Hawaiian Islands where relief is furnished beneficiaries. Medical treatment is given by officers who are also on quarantine and immigration duty. The out-patient office in the Federal building is conveniently located near the wharves. Patients requiring hospitalization are cared for in contract institutions. Most of those who apply for treatment are American merchant seamen. There are also some Coast Guard members, Employees' Compensation Commission cases, and occasional beneficiaries of other classes. A large number of applicants for civil-service appointments are given physical examinations. During the year 297 patients were given a total of 3,367 days' hospital treatment. At the out-patient office 907 patients were given 1,793 treatments. Seven hundred and three physical examinations were made, of which 532 were of applicants for civil-service positions. Medical advice by radio was furnished to masters of three ships at sea.

Relief station, Los Angeles, Calif.—Surg. R. H. Heterick in charge.

In addition to the usual out-patient and hospital care of legal beneficiaries, of which a considerable number are patients of the Employees' Compensation Commission, services have been rendered to the following: Post Office Department; Department of Agriculture, mainly the Forest Service and Food and Drug Administration; Coast Guard; Bureau of Industrial Alcohol; Immigration Service; Internal Revenue; Bureau of Animal Industry; Weather Bureau; Department of Commerce, both the Radio Division and the Aeronautics Branch; Land Office; and Census Bureau.

The practice of having late office hours two nights a week is still continued. Two seamen were assisted to enter Sailors' Snug Harbor.

Relief station, Manila, P. I.—Surg. R. W. Hart in charge.

Hospital relief was furnished in the Philippine Islands only at the port of Manila by an officer assigned to duty at the hospital from the quarantine office. A total of 218 patients were admitted and received an aggregate of 4,925 hospital days. A total of 797 surgical operations were performed.

Out-patient offices were maintained at the ports of Manila, Cebu, and Iloilo. A total of 1,588 beneficiaries were given 2,791 treatments.

Relief station, Milwaukee, Wis.—Acting Asst. Surg. Robert J. Bach in charge.

During the year 157 patients were admitted to contract hospital for a total of 2,042 days, an average of 13 days per patient. There were 41 surgi-

cal operations performed by the medical officer in charge and 114 medical patients treated, which necessitated 379 calls and 461 hours of work at the hospital. All in-patients requiring extensive hospital care but able to travel, 98 in number, were transferred to the marine hospital at Chicago.

Relief station, Philadelphia, Pa.—Medical Director Rupert Blue in charge. The station was moved from 410 Chestnut Street to the new building at 225 Chestnut Street. New modern equipment was installed and a dental clinic, laboratory, X ray, and physiotherapy facilities were supplied, with an increased number of trained personnel. A marked improvement in the work of the station is being effected.

New cases admitted to out-patient treatment numbered 5,342. Merchant seamen received 60 per cent of the hospital treatment furnished, and patients of the Employees' Compensation Commission 26 per cent, the remainder being divided between Coast Guard personnel and civilian employees from vessels of the Engineer Corps of the Army.

Relief station, Port Arthur, Tex.—Surg. W. A. Korn in charge.

This station serves the ports of Sabine, Port Arthur, Port Neches, Beaumont, and Orange, Tex.; also Lake Charles, La. American seamen were the principal beneficiaries.

In May, 1930, five cases of typhoid fever were received from the U. S. dredge *Raymond*. The crew was inoculated against typhoid fever and no further cases occurred. As a precautionary measure, in April, 1931, the crews of three United States dredges operating in the Sabine Neches Canal were inoculated against typhoid fever. Medical advice by radio to ships at sea was furnished 28 times. Three hundred and eighty-six specimens of blood for Wassermann test were sent to the marine hospital at New Orleans, of which 55 proved positive. Twenty-five patients were transferred to the marine hospital at New Orleans for further treatment.

Relief station, Portland, Oreg.—Passed Asst. Surg. F. S. Fellows in charge.

Station activities have been affected only slightly by the nation-wide business depression. In vaccinating 145 applicants for admission to Citizens' Military Training Camp it was observed that fully 75 per cent of those vaccinated for smallpox were primary vaccinations, resulting in about 98 per cent takes. The camp is therefore of considerable value to this locality from a public health standpoint.

An increasing number of Employees' Compensation Commission patients are being referred to this station for treatment, many of whom came from a long distance—from Southern Washington, various points in Oregon and occasionally from Alaska, Idaho and other States. During the year the average stay of patients at the contract hospital was 13¼ days.

Relief station, St. Thomas, Virgin Islands.—Passed Asst. Surg. E. H. Carnes in charge.

The relief furnished by this station continues to increase but is still of small amount. Out-patient relief was furnished 393 times, the largest number in 10 years. However, only 60 days of hospital relief were furnished in the contract hospital. The out-patient office is amply equipped to treat the conditions usually met with among the beneficiaries served. The Municipal Hospital continues to furnish satisfactory contract care.

Relief station, San Pedro, Calif.—Surg. H. E. Trimble in charge.

The out-patient office is in rented quarters near the water front, combined with the quarantine and immigration activities. It will eventually be removed to the new Federal building, for which plans have been prepared by the Supervising Architect.

Merchant seamen and Coast Guard patients predominated. For out-patients and in-patients a total of 597 antisypilitic injections and 565 emergency dental treatments were given; 1,886 laboratory examinations were made and 832 X rays taken. Vaccinations against smallpox and inoculations against typhoid fever numbered 533. Two insane and several indigent senile and chronic cases were turned over to the care of Los Angeles County. Spinal anesthesia was used extensively in the operative work. Of the hospital cases, 75 were detained immigrants or deportees. It was necessary to transfer 178 hospital patients to the marine hospital at San Francisco.

Twenty-four-hour radio service was maintained for the relief of sickness occurring on board vessels at sea.

Relief station, Seattle, Wash.—Medical Director L. D. Fricks in charge.

The number of patients hospitalized showed a small increase over the preceding year. Of 4,791 out-patients, 4,136 were merchant seamen.

On July 22, 1931, construction was started on the new marine hospital, which will be completed in the fall of 1932. (See cut of the architects' sketch.) This institution of 300 beds or more is designed to serve ships from the entire Puget Sound area and will also be used extensively by the Veterans' Administration.

Relief station, Washington, D. C.—Senior Surg. R. M. Grimm in charge.

Practically all classes of service beneficiaries were represented among the patients treated. The great majority were beneficiaries of the Employees' Compensation Commission, securing treatment for injuries incurred in the performance of their duty. This group has presented a great variety of surgical conditions. They constituted 83 per cent of the total number of patients and received 90 per cent of the total number of treatments.

The practice of referring to this office certain claimants under the District of Columbia workmen's compensation act has been continued. These claimants are referred to appropriate specialists for examination and report and the vouchers for the bills are approved by this office. Several beneficiaries under the "Act to provide for the vocational rehabilitation of disabled residents of the District of Columbia, and for other purposes," have been cared for upon the request of the local supervisor in charge.

Physical examinations of persons entitled thereto have constituted a large percentage of the work of the station and have occupied the time of two and sometimes three medical officers. The great bulk of these examinations has been for applicants and employees in the civil service or applicants for retirement and reinstatement. These examinations are often time-consuming because of the numerous diagnostic procedures required. The preparation of long reports in these cases has taken up much of the time of the clerical force. Patients requiring long periods of hospitalization have usually been transferred to nearby marine hospitals; 37 patients were transferred to the Baltimore Marine Hospital, 1 to Boston, and 7 to Norfolk.

Supply station, Perry Point, Md.—Asst. Pharmacist R. D. Kinsey in charge.

Two large warehouses of tile and concrete construction and two sets of quarters are provided here through the courtesy of the Veterans' Administration. Requisitions are filled for Coast Guard units, vessels of the Lighthouse Service, and second and third class relief stations, for which purpose stock is purchased semiannually. Certain articles appearing on requisitions from first-class stations are also supplied from Perry Point, although commonly used medicines, gauze, absorbent cotton, janitor and laundry supplies, and other bulky articles are purchased twice a year for shipment direct from the contractors to the marine hospitals. Surplus stock received from the Army, Navy, Veterans' Administration, and marine hospitals and quarantine stations is stored here, reconditioned if the cost of the work is less than 40 per cent of its value, and reissued. Considerable economies were effected by using second-hand furniture from the Government hotels in Washington. Supplies of whisky and alcohol for medicinal use are obtained from the collector of customs and large quantities of empty bottles from the Bureau of Industrial Alcohol. The following table shows the chief issuing activities of the supply station, fiscal year 1931:

Stations	Number of packages shipped	Weight	Value of purchased stock	Value of surplus stock	Total value
Marine hospitals.....	6,121	512,833	\$74,267	\$72,165	\$146,432
Relief stations.....	1,155	43,631	5,417	3,649	9,066
Quarantine stations.....	139	15,262	265	4,708	4,973
Foreign stations.....	168	6,666	3,954	1,631	5,585
Scientific research stations.....	41	714	40	235	275
Surgeon General's office.....	31	1,700	21	856	877
Coast Guard.....	1,785	60,072	9,374	7,514	16,888
Lighthouse Service.....	253	1,766	197	210	407
Other Government stations (surplus only).....	521	71,395	-----	43,213	43,213
Penal institutions.....	226	21,683	978	5,109	6,087
Miscellaneous.....	4	10	6	-----	6
Total.....	10,444	735,732	94,519	139,290	233,809

In the interest of economy some simple compounds were manufactured, including:

Liniment.....	gallons..	455
Sirup white pine compound.....	do.....	100
Liquor cresolis compound.....	do.....	430
Liquor antisepticus.....	do.....	30
Tincture iodine.....	do.....	20
Tincture opium camphorated.....	do.....	35
Tincture nux vomica.....	do.....	15
Tincture hyoscyamus.....	do.....	15
First-aid kits.....	each..	299

Surplus stock acquired shortly after the World War is rapidly becoming exhausted, making it necessary to purchase many supplies formerly obtained without cost. During the fiscal year 1930, 56 items formerly carried in surplus stock at Perry Point, and in 1931, 50 other items became exhausted and were added to the list of purchased articles.

The supply station continues as in the past, to be the recipient of numerous courtesies on the part of the local Veterans' Administration officials.

CONSOLIDATED AND DETAILED REPORTS

The following tables give the consolidated and detailed reports for the marine hospitals and relief stations:

Consolidated X-ray report, marine hospitals and second-class relief stations

Number of patients examined.....	47, 042
Number of exposures (classified as follows):	
Chest.....	13, 054
Bone and joint.....	42, 112
Dental.....	23, 289
Gastro intestinal and urogenital tracts.....	17, 440
Miscellaneous.....	7, 462
Total.....	103, 357

Consolidated laboratory report, marine hospitals and second-class relief stations

BLOOD		URINE	
Complement fixation: Syphilis.....	57, 394	Urinalyses.....	103, 632
Kahn test for syphilis.....	7, 725	Renal function tests.....	1, 187
Erythrocyte counts.....	9, 489	Quantitative sugar.....	4, 228
Leucocyte counts.....	12, 836		
Differential leucocyte counts.....	8, 763	FECES	
Malaria.....	3, 438	Parasites and ova.....	8, 000
Typing.....	1, 228	Dysentery.....	318
Blood cultures.....	489	Metabolic examination.....	64
Chemical determinations:		Occult blood.....	1, 708
Carbon dioxide (Van Slyke or similar).....	162		
Creatinine.....	302	SPUTUM	
Incoagulable nitrogen.....	532	Tubercle bacillus.....	27, 425
Sugar.....	3, 184	Pneumococcus.....	381
Urea nitrogen.....	340	Other organisms.....	281
Uric-acid nitrogen.....	21		
Total nitrogen.....	352	STOMACH OR DUODENAL CONTENTS	
Hemoglobin.....	9, 615	Routine.....	2, 695
Chlorides.....	37	Special.....	98
Unclassified.....	1, 221		
Coagulation time.....	3, 319		

SPINAL FLUID		WATER ANALYSIS	
Wassermann.....	1, 646	Chemical.....	27
Colloidal gold reaction.....	927	Bacteriological.....	108
Globulin test.....	1, 629	MILK ANALYSIS	
Cell count.....	1, 513	Chemical.....	28
Bacteriological examination.....	165	Bacteriological.....	74
Other examinations.....	256		
BACTERIOLOGICAL EXAMINATIONS		ANIMAL INOCULATIONS	
Pus.....	3, 784	For diagnosis.....	239
Exudates.....	269	PATHOLOGICAL EXAMINATIONS	
Transudates.....	251	Autopsies.....	372
Discharges:		Tissue examinations.....	2, 318
Urethral.....	22, 831	VACCINES	
Other.....	1, 872	Autogenous.....	260
T. pallidum:		MISCELLANEOUS EXAMINATIONS	
Dark field.....	2, 389	Otherwise unclassified.....	6, 572
Smear.....	252	Total examinations.....	322, 752
Throat smears.....	2, 101		
Cultures:			
Throat.....	521		
Other.....	1, 265		
Bacteriological counts.....	23		
TYPHOID AND PARATYPHOID EXAMINATIONS			
Agglutination tests.....	280		
Feces.....	201		
Urine.....	115		

Consolidated report or surgical procedures at marine hospitals and other relief stations

Amputation, all or in part.....	285	Nerves, operations on.....	50
Appendectomy.....	1, 315	Osteotomy.....	142
Arthrectomy.....	1	Plastic repair.....	129
Arthroplasty.....	14	Puncture of, unclassified.....	3, 206
Arthrotomy.....	22	Repair of, unclassified.....	242
Aspiration.....	1, 140	Resection of, unclassified.....	224
Blood vessels, operations on.....	85	Sequestrotomy.....	22
Bone graft.....	22	Sinusetomy.....	135
Cauterization.....	420	Skin grafting.....	73
Cholecystectomy.....	68	Spinal puncture.....	1, 258
Cholecystotomy.....	13	Stomach, operations on.....	88
Circumcision.....	690	Submucous resection.....	591
Cystoscopy.....	1, 282	Suture of minor wounds.....	1, 837
Dilatation of, unclassified.....	2, 723	Tendons, operations on.....	73
Excision of, unclassified.....	2, 103	Testicle, operations on.....	297
Exploratory incision.....	219	Thoracoplasty, thoracotomy,	
Extraction of teeth.....	36, 900	tracheotomy.....	109
Eye, operations on.....	282	Thyroidectomy.....	47
Foreign body, removal of.....	3, 739	Tonsillectomy.....	2, 965
Fracture, closed.....	910	Transfusions, blood.....	164
Fracture, open.....	186	Turbineotomy.....	201
Hemorrhoids.....	867	Urethrotomy.....	48
Hernia.....	2, 160	Total.....	74, 340
Hydrocele.....	228	Miscellaneous.....	1, 572
Incision and drainage.....	6, 232	Grand total.....	75, 912
Intestines, operations on.....	217		
Joint dislocation.....	99		
Kidney and bladder, operations on.....	66		
Lymphadenectomy.....	93		
Mastoid operations.....	58		

(The above does not include 49,806 injections of salvarsan, arsphenamine, and kindred preparations.)

TABLE 1.—Number of patients treated annually, 1868 to 1931¹

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	1900.....	56, 355
1869.....	11, 356	1901.....	58, 381
1870.....	10, 560	1902.....	56, 310
After reorganization:		1903.....	58, 573
1871.....	14, 256	1904.....	58, 556
1872.....	13, 156	1905.....	57, 013
1873.....	13, 529	1906.....	54, 363
1874.....	14, 356	1907.....	55, 129
1875.....	15, 009	1908.....	54, 301
1876.....	16, 808	1909.....	53, 704
1877.....	15, 175	1910.....	51, 443
1878.....	18, 223	1911.....	52, 209
1879.....	20, 922	1912.....	51, 078
1880.....	24, 860	1913.....	50, 604
1881.....	32, 613	1914.....	53, 226
1882.....	36, 184	1915.....	55, 782
1883.....	40, 195	1916.....	58, 557
1884.....	44, 761	1917.....	64, 022
1885.....	41, 714	1918.....	71, 614
1886.....	43, 822	1919.....	79, 863
1887.....	45, 314	1920.....	110, 907
1888.....	48, 203	1921.....	144, 344
1889.....	49, 518	1922.....	153, 633
1890.....	50, 671	1923.....	126, 956
1891.....	52, 992	1924.....	159, 686
1892.....	53, 610	1925.....	204, 944
1893.....	53, 317	1926.....	245, 140
1894.....	52, 803	1927.....	249, 973
1895.....	52, 643	1928.....	240, 592
1896.....	53, 804	1929.....	260, 552
1897.....	54, 477	1930.....	279, 350
1898.....	52, 709	1931.....	259, 364
1899.....	55, 489		

¹ 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; 1926, 3,749; 1927, 2,830; 1928, 3,448; 1929, 4,907; 1930, 6,817; and 1931, 9,278.

² 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 1931

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1931	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.....	268, 642	47, 033	1, 304	4, 410	1, 666, 215	221, 609	910, 466	94, 487
FIRST-CLASS STATIONS MARINE HOSPITALS								
Baltimore, Md.....	9, 764	2, 023	65	199	75, 766	7, 741	40, 480	2, 526
Boston, Mass.....	7, 408	1, 994	47	153	56, 205	5, 414	31, 891	4, 039
Buffalo, N. Y.....	3, 974	974	30	72	29, 254	3, 000	12, 339	1, 713
Carville, La.....	1, 679	389	23	337	116, 278	1, 290	1, 930	.....
Chicago, Ill.....	33, 059	1, 167	45	153	58, 808	31, 892	79, 004	1, 160
Cleveland, Ohio.....	4, 821	2, 072	75	248	76, 281	2, 749	18, 176	1, 206
Detroit, Mich.....	3, 409	1, 148	48	123	47, 817	2, 261	12, 558	1, 945
Ellis Island, N. Y.....	6, 823	5, 848	125	443	163, 799	975	1, 300	289
Evansville, Ind.....	578	463	23	69	25, 488	115	219	112
Fort Stanton, N. Mex.....	836	376	26	235	90, 574	460	2, 156	106
Key West, Fla.....	1, 116	613	15	76	32, 459	503	1, 304	103
Louisville, Ky.....	1, 184	856	27	84	30, 248	328	1, 820	1, 253
Memphis, Tenn.....	1, 981	597	19	67	23, 185	1, 384	5, 277	1, 375
Mobile, Ala.....	3, 538	849	20	96	34, 505	2, 689	8, 189	2, 033
New Orleans, La.....	12, 196	4, 510	125	377	141, 294	7, 686	31, 525	3, 974
New York, N. Y.....	30, 171					30, 171	178, 642	16, 045

TABLE 2.—Transactions at United States Marine hospitals, etc.—Continued

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1931	Number of days relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
FIRST-CLASS STATIONS								
MARINE HOSPITALS—continued								
Norfolk, Va.....	8,377	2,534	79	207	81,656	5,843	23,653	1,884
Pittsburgh, Pa.....	2,120	758	51	96	31,926	1,362	6,156	585
Portland, Me.....	1,719	856	21	68	26,715	863	5,238	390
Port Townsend, Wash.....	1,247	902	25	94	35,663	345	1,170	59
St. Louis, Mo.....	1,819	671	33	94	32,479	1,148	5,424	1,424
San Francisco, Calif.....	14,354	3,367	93	247	103,010	10,987	54,931	2,721
Savannah, Ga.....	4,391	1,803	46	150	58,816	2,588	8,781	2,192
Stapleton, N. Y.....	7,705	3,753	81	258	105,222	3,952	21,890	311
Vineyard Haven, Mass.....	323	186	3	24	11,133	137	350	17
Contract overflow hospitals.....	216	216	2	35	19,206	.....	.....	.....
Total.....	164,808	38,925	1,147	4,005	1,507,787	125,883	554,403	47,462
SECOND, THIRD, AND FOURTH CLASS STATIONS, ETC.								
Aberdeen, Wash.....	322	24	.....	.....	200	298	524	184
Albany, N. Y.....	175	17	1	1	223	118	547	261
Anacortes, Wash.....	232	22	.....	.....	156	250	559	53
Apalachicola, Fla.....	49	11	.....	.....	126	38	93	1
Ashland, Wis.....	143	12	.....	.....	208	131	243	87
Ashtabula, Ohio.....	278	48	3	.....	207	230	521	31
Astoria, Ore.....	500	68	.....	2	629	432	1,143	313
Balboa Heights, Canal Zone.....	737	219	1	4	3,321	518	620	.....
Bangor, Me.....	44	5	.....	1	58	39	68	49
Bath, Me.....	17	1	.....	.....	3	16	35	1
Bay City, Mich.....	71	4	.....	1	30	67	306	.....
Beaufort, N. C.....	684	110	1	.....	1,396	574	3,140	43
Beaufort, S. C.....	3	.....	.....	.....	.....	3	15	.....
Bellingham, Wash.....	284	18	.....	.....	169	266	902	463
Beloxi, Miss.....	586	35	1	.....	242	551	2,013	159
Boothbay Harbor, Me.....	38	6	.....	.....	58	32	77	17
Bridgeport, Conn.....	21	9	1	1	93	12	14	3
Brunswick, Ga.....	69	20	1	1	16	56	89	21
Burlington, Iowa.....	21	.....	.....	.....	202	9	32	.....
Cairo, Ill.....	639	149	10	3	1,715	490	1,278	89
Calais, Me.....	2	.....	.....	.....	.....	2	9	17
Cambridge, Md.....	89	16	1	2	191	73	234	4
Cape May, N. J.....	977	87	1	1	497	890	2,472	174
Charleston, S. C.....	828	98	4	1	806	730	2,004	262
Chincoteague, Va.....	165	.....	.....	.....	.....	165	370	26
Cincinnati, Ohio.....	160	42	1	1	733	118	293	236
Cordova, Alaska.....	170	46	2	3	610	124	265	8
Corpus Christi, Tex.....	157	49	1	2	662	108	174	54
Crisfield, Md.....	1,141	16	1	.....	139	1,125	2,230	9
Duluth, Minn.....	689	68	1	2	953	621	953	196
Eastport, Me.....	27	.....	.....	.....	.....	27	73	7
Edenton, N. C.....	36	.....	.....	.....	.....	36	78	6
Elizabeth City, N. C.....	128	2	.....	.....	17	126	520	57
El Paso, Tex.....	142	9	1	1	385	133	1,233	110
Erie, Pa.....	462	48	2	1	496	414	1,753	581
Escanaba, Mich.....	24	7	.....	.....	83	17	35	2
Eureka, Calif.....	191	49	1	2	619	142	286	23
Everett, Wash.....	266	40	1	1	491	226	472	35
Fall River, Mass.....	97	6	1	.....	47	91	177	12
Gallipolis, Ohio.....	105	40	.....	2	640	65	260	1
Galveston, Tex.....	4,626	670	13	41	12,889	3,956	12,062	1,952
Gary, Ind.....	68	.....	.....	.....	.....	68	241	.....
Georgetown, S. C.....	112	1	1	.....	6	111	207	8
Gloucester, Mass.....	596	19	.....	.....	186	577	1,475	116
Grand Haven, Mich.....	104	12	.....	1	74	92	194	46
Green Bay, Wis.....	93	16	2	.....	172	77	129	13
Gulfport, Miss.....	31	4	.....	.....	11	27	43	2
Hancock, Mich.....	43	.....	.....	.....	.....	43	56	16
Hartford, Conn.....	9	8	.....	.....	76	1	3	.....
Honolulu, T. H.....	948	194	3	9	3,414	754	1,793	703
Houston, Tex.....	1,564	250	1	14	4,783	1,314	3,094	101
Indiana Harbor, Ind.....	139	1	.....	.....	1	138	256	.....
Jacksonville, Fla.....	879	91	1	2	1,148	788	2,252	417
Juneau, Alaska.....	310	82	1	1	1,294	228	272	44
Ketchikan, Alaska.....	1,169	240	7	7	3,167	929	1,878	38
La Crosse, Wis.....	62	16	.....	1	170	46	63	91
Lee Hall, Va.....	1,821	.....	.....	.....	.....	1,821	2,441	77

TABLE 2.—Transactions at United States Marine hospitals, etc.—Continued

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1931	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.—CON.								
Lewes, Del.	197	21			228	176	589	17
Los Angeles, Calif.	1,612	508		11	8,795	1,104	9,426	824
Ludington, Mich.	154	14	2		173	140	410	10
Machias, Me.	24					24	43	10
Manila, P. I.	1,857	229	2	10	4,925	1,628	2,791	487
Manistee, Mich.	106	25	1		344	81	619	9
Manitowoc, Wis.	250	52			445	198	435	1
Marquette, Mich.	295	21		1	215	274	820	84
Marshfield, Oreg.	97	21		1	184	76	136	21
Menominee, Mich.	62	2			17	60	197	36
Miami, Fla.	631	69	2	2	618	562	1,024	271
Milwaukee, Wis.	965	158	1	5	2,046	807	2,222	540
Morehead City, N. C.	301	64		1	803	237	1,214	6
Nantucket, Mass.	84	4			30	80	1,81	5
Nashville, Tenn.	63	4		1	75	59	143	86
Natchez, Miss.	285	66		1	1,285	219	699	34
Newark, N. J.	22	3			19	19	63	21
New Bedford, Mass.	306	21	2		183	285	531	154
New Bern, N. C.	234	78	1		851	156	244	38
New Haven, Conn.	139	13	1	1	197	126	276	123
New London, Conn.	280	52	2	3	551	228	336	129
Newport, Ark.	71	2			23	69	220	5
Newport, Oreg.	293	40	1		479	253	443	47
Newport, R. I.	245					245	357	56
Newport News, Va.	112	13			116	21	76	
Nome, Alaska	42	2			35	110	239	61
Ogdensburg, N. Y.	103	7			134	35	118	
Olympia, Wash.	163	9			72	154	438	78
Oswego, N. Y.	378	46			398	332	897	43
Paducah, Ky.	111	28	1		191	83	207	3
Panama City, Fla.	506	11	4	3	1,223	395	1,272	91
Pensacola, Fla.	68	7			78	61	101	66
Perth Amboy, N. J.	350	15	1		148	315	1,354	2
Petersburg, Alaska	6,375	705	12	18	7,874	5,670	26,131	4,493
Philadelphia, Pa.	130	60	1	3	1,177	70	207	56
Ponce, P. R.	191	30			159	161	303	44
Port Angeles, Wash.	1,582	103	6	0	1,792	1,479	3,274	133
Port Arthur, Tex.	237	10			56	227	709	235
Port Huron, Mich.	1,710	198	2	12	4,205	1,512	4,535	1,890
Portland Ore.	1					1		
Portsmouth, N. H.	493	47	1	2	732	446	1,013	338
Providence, R. I.	132					132	299	24
Provincetown, Mass.	438					438	988	4
Reedville, Va.	134	19			143	115	232	86
Richmond, Va.	2,229	19	1		180	2,210	8,370	2,777
Rock Island, Ill.	10					10	32	
Saginaw, Mich.	86	4			60	82	391	5
St. Thomas, Virgin Islands.	399	51	2	4	1,277	348	1,156	924
San Diego, Calif.	53	7			40	46	79	15
Sandusky, Ohio	832	189	2	7	3,304	663	2,493	170
San Juan, P. R.	4,569	371	10	9	5,055	4,198	11,171	593
San Pedro, Calif.	1,040	145	2	11	1,527	895	1,568	180
Sault Ste. Marie, Mich.	5,327	260	9	5	3,372	5,067	18,614	6,861
Seattle, Wash.	238	71	2	7	912	167	342	1
Seward, Alaska	68	2			32	66	140	21
Sheboygan, Wis.	89	3			64	86	175	7
Sitka, Alaska	4					4	5	
Solomons, Md.	42	8			51	34	93	11
South Bend, Wash.	571	85	1	7	893	486	714	73
Southport, N. C.	338	58			504	280	587	23
Superior, Wis.	304	43	1	3	618	261	583	144
Tacoma, Wash.	507	52		1	642	455	813	217
Tampa, Fla.	624	100	5	6	1,279	524	1,482	221
Toledo, Ohio	310	15			63	295	1,248	66
Vicksburg, Miss.	3,550	221	3	11	2,952	3,329	26,061	10,724
Washington, D. C.	1,092					1,092	11,938	
Washington, D. C. (dental clinic)	230	26	1		246	204	336	10
Washington, N. C.	678					678	3,344	26
White Stone, Va.	22	4			63	18	38	
Wilmington, Del.	599	43		1	375	556	1,716	160
Wilmington, N. C.	52	16	1	1	235	36	116	1
Wrangell, Alaska								

TABLE 2.—*Transactions at United States Marine hospitals, etc.*—Continued

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1931	Number of days relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
MISCELLANEOUS								
Curtis Bay, Md.....	2,333					2,333	14,740	583
Fernandina, Fla.....	20					20	154	
St. Elizabeths Hospital, Washington, D. C.....	157	157	7	138	47,474			
Special acting assistant surgeons for U. S. Coast Guard and Lighthouse Service.....	5,490	159	2	5	1,352	5,331	17,007	1,596
U. S. Coast Guard vessels and bases.....	26,827	93	1		953	26,734	112,099	3,702
Emergency.....	51	19			131	32	56	1
Examinations abroad for U. S. Veterans' Administration.....								2
Total.....	103,834	8,108	157	405	158,428	95,726	356,063	47,025
Grand total.....	268,642	47,033	1,304	4,410	1,666,215	221,609	910,466	94,487

TABLE 3.—Relief furnished at United States marine hospitals and other relief stations, fiscal year 1931, classified by beneficiary

S0597-31-18	Beneficiary	Class of station	Total number of patients treated	Number of patients treated in hospital	Died	Patients remaining in hospital June 30, 1931	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.....		93,039	20,232	616	2,200	876,321	72,807	361,354	8,478
	Other relief stations.....		45,871	5,365	117	303	113,884	40,506	111,038	5,127
	Total.....		138,910	25,597	733	2,503	990,205	113,313	472,392	13,605
Foreign seamen.....	First-class stations.....		523	303	8	14	6,480	220	692	4
	Other relief stations.....		103	52	2	1	979	51	86	35
	Total.....		626	355	10	15	7,459	271	778	39
U. S. Coast Guard.....	First-class stations.....		8,126	2,917	19	169	71,902	5,209	30,030	4,417
	Other relief stations.....		8,096	777	6	23	12,513	7,319	28,209	2,261
	Special acting assistant surgeons.....		5,362	156	2	5	1,345	5,206	16,684	1,583
	Coast Guard vessels and bases.....		26,827	93	1	-----	953	26,734	112,099	3,702
	Emergency.....		39	15	-----	-----	116	24	41	1
Total.....		48,450	3,958	28	197	86,829	44,492	187,063	11,964	
U. S. Bureau of Fisheries.....	First-class stations.....		37	12	-----	-----	238	25	287	-----
	Other relief stations.....		23	4	1	1	33	19	34	4
	Total.....		60	16	1	1	271	44	321	4
U. S. Army.....	First-class stations.....		286	60	3	2	940	226	691	176
	Other relief stations.....		105	13	-----	-----	93	92	191	95
	Total.....		391	73	3	2	1,033	318	882	271
U. S. Navy and Marine Corps.....	First-class stations.....		144	47	2	3	567	97	484	20
	Other relief stations.....		53	17	-----	1	137	36	70	7
	Total.....		197	64	2	4	704	133	554	27
Mississippi River Commission.....	First-class stations.....		2	1	-----	1	365	1	1	-----
	Other relief stations.....		29	11	-----	-----	136	18	22	1
	Total.....		31	12	-----	1	501	19	23	1

TABLE 3.—Relief furnished at United States marine hospitals and other relief stations, fiscal year 1931, classified by beneficiary—Contd.

Beneficiary	Class of station	Total number of patients treated	Number of patients treated in hospital	Died	Patients remaining in hospital June 30, 1931	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
Seamen, U. S. Engineer Corps and Army transport service.	First-class stations.....	2,344	716	32	74	30,227	1,628	5,463	120
	Other relief stations.....	2,080	319	9	16	4,206	1,761	4,787	34
	Total.....	4,424	1,035	41	90	34,433	3,389	10,250	154
U. S. Lighthouse Service.....	First-class stations.....	1,002	261	13	22	8,973	741	3,482	96
	Other relief stations.....	1,065	125	3	5	1,851	940	2,284	83
	Special acting assistant surgeons.....	128	3			7	125	323	13
	Emergency.....	8	4			15	4	7	
Total.....	2,203	393	16	27	10,846	1,810	6,096	192	
U. S. Coast and Geodetic Survey.....	First-class stations.....	383	94	1	3	2,188	289	905	274
	Other relief stations.....	623	68		5	1,091	555	2,175	313
	Emergency.....	4					4	8	
Total.....	1,010	162	1	8	3,279	848	3,088	587	
U. S. Employees' Compensation Commission.	First-class stations.....	40,039	1,588	12	137	41,407	38,451	114,487	15,581
	Other relief stations.....	10,554	912	11	34	15,635	9,642	64,542	6,762
	Total.....	50,593	2,500	23	171	57,042	48,093	179,029	22,343
U. S. Veterans' Administration.....	First-class stations.....	9,172	8,873	373	934	306,170	299	4,127	1,196
	Other relief stations.....	106	54	4	2	1,015	52	227	123
	Foreign.....								2
Total.....	9,278	8,927	377	936	307,185	351	4,354	1,321	
U. S. Immigration Service.....	First-class stations.....	3,360	2,737	24	84	36,584	623	891	108
	Other relief stations.....	379	112		9	4,320	267	1,669	624
	Total.....	3,739	2,849	24	93	40,904	890	2,560	732
U. S. Public Health Service officers and employees.	First-class stations.....	5,590	657	15	22	8,614	4,933	30,393	694
	Other relief stations.....	1,080	7	1		71	1,073	9,147	142
	Total.....	6,670	664	16	22	8,685	6,006	39,540	736

Lepers.....	First-class stations.....	390	390	23	337	116,279			
	Other relief stations.....	1					1	1	1
	Total.....	391	390	23	337	116,279	1	1	1
Masters, mates, and pilots.....	First-class stations.....								4,562
	Other relief stations.....								2,223
	Total.....								6,785
Citizens' military training camps.....	First-class stations.....	114					114	390	297
	Other relief stations.....	443					443	1,002	404
	Total.....	557					557	1,392	701
United States civil-service applicants and and employees.....	First-class stations.....								7,835
	Other relief stations.....								12,094
	Total.....								19,929
Postal employees.....	First-class stations.....								595
	Other relief stations.....								291
	Total.....								886
Alaska cannery workers.....	First-class stations.....								
	Other relief stations.....	418					418	418	6,674
	Total.....	418					418	418	6,674
U. S. Shipping Board, for crews.....	First-class stations.....								1,305
	Other relief stations.....								1,131
	Total.....								2,436
Applicants, U. S. Bureau of the Census.....	First-class stations.....								
	Other relief stations.....								1,917
	Total.....								1,917
Miscellaneous.....	First-class stations.....	257	37	6	3	532	220	726	1,804
	Other relief stations.....	437	1			28	436	999	1,378
	Total.....	694	38	6	3	560	656	1,725	3,182
Total.....	First-class stations.....	164,808	38,925	1,147	4,005	1,507,787	125,883	554,403	47,462
	Other relief stations.....	71,466	7,837	154	400	155,992	63,629	226,901	41,724
	Special acting assistant surgeons.....	5,490	159	2	5	1,352	5,331	17,007	1,596
	Coast Guard vessels and bases.....	26,827	93	1		953	26,734	112,099	3,702
	Emergency.....	51	19			131	32	56	1
	Foreign.....								2
	Grand total.....	268,642	47,033	1,304	4,410	1,666,215	221,609	910,466	94,487

TABLE 4.—Cause of admission for discharged patients and condition on discharge, United States marine hospitals and other relief stations, fiscal year 1931

Disease or condition	Number having specified diseases ¹ or injury					Condition on discharge of patients for specified diseases or injury				
	Major condition for which admitted ²	Condition second in importance	Condition third in importance ³	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.....	50	-----	-----	-----	-----	13	26	1	-----	10
Blood and blood-forming organs, diseases and injuries of.....	77	-----	-----	-----	-----	2	50	1	9	15
Bones and cartilages, diseases and injuries of.....	2,239	-----	-----	-----	-----	269	1,219	7	39	705
Circulatory system, diseases and injuries of:										
Heart disease, valvular.....	282	228	87	10	607	3	192	-----	41	46
Varicose veins.....	302	186	70	-----	558	46	201	1	3	51
All others.....	1,365	-----	-----	-----	-----	97	797	6	171	294
Communicable and infectious diseases, not including tuberculosis and venereal:										
Conjunctivitis, granular trachomatous.....	20	3	2	-----	25	2	12	1	-----	5
Dengue.....	2	1	-----	-----	3	2	-----	-----	-----	-----
Influenza.....	1,016	43	9	-----	1,068	469	408	-----	12	127
Malaria.....	314	33	7	1	355	77	185	-----	-----	52
Rheumatic fever, acute.....	89	10	2	6	107	11	55	-----	1	22
Typhoid fever.....	63	7	2	-----	72	43	6	-----	11	3
All others.....	775	-----	-----	-----	-----	380	281	2	20	92
Dental.....	279	4,167	2,203	5	6,654	46	170	-----	-----	63
Digestive system, diseases and injuries of:										
Appendicitis.....	1,148	201	64	-----	1,413	544	448	2	35	119
Gastritis.....	352	65	15	9	441	70	240	-----	1	41
Hemorrhoids.....	803	356	131	2	1,292	282	426	-----	1	194
All others.....	2,055	-----	-----	-----	-----	344	1,321	2	54	334
Ear, nose, and throat, diseases and injuries of:										
Deviation of nasal septum.....	459	410	131	-----	1,000	161	232	-----	-----	66
Otitis media.....	248	195	87	2	532	32	159	1	1	55
Tonsillitis.....	2,696	1,083	344	-----	4,123	1,209	1,230	-----	1	256
All others.....	955	-----	-----	-----	-----	305	489	1	8	152
Endocrines, diseases and injuries of.....	294	-----	-----	-----	-----	22	187	1	25	59
Eye and adnexa, diseases and injuries of.....	588	-----	-----	-----	-----	119	320	6	-----	143
Genito-urinary system, diseases and injuries of (exclusive of venereal):										
Nephritis.....	212	162	79	2	455	7	114	2	55	34
All others.....	1,490	-----	-----	-----	-----	307	854	3	26	300
Hernia.....	1,875	383	158	-----	2,416	773	809	2	10	281
Joints and bursae, diseases and injuries of:										
Arthritis.....	841	291	90	335	1,557	61	609	5	8	158
All others.....	466	-----	-----	-----	-----	46	265	3	-----	152
Leprosy.....	51	-----	-----	-----	-----	-----	20	-----	23	8
Lymphatic system, diseases and injuries of:										
Lymphadenitis.....	312	58	21	202	593	73	166	-----	-----	73
All others.....	37	-----	-----	-----	-----	6	19	-----	1	11
Muscles, fasciae, tendons and tendon sheaths, diseases and injuries of.....	1,233	-----	-----	-----	-----	208	689	1	-----	335

¹ Except in the case of specific diseases, statistics are given only for the major condition for which admitted.

² Represents number of discharges for each condition.

³ Where sequelae were given, no third diagnosis was recorded.

TABLE 4.—Cause of admission, etc.—Continued

Disease or condition	Number having specified diseases or injury					Condition on discharge of patients for specified diseases or injury				
	Major condition 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.....	48	11	2		61	2	28	1		17
Neuritis.....	295	93	25	13	426	25	210	3	2	55
All others.....	556					34	323	14	26	159
Obstetric and gynecological conditions.....	29					12	14			3
Parasitic diseases:										
Uncinariasis.....	19	47	12		78	2	13			4
All others.....	159					26	103		1	29
Poisonings and intoxications:										
Alcohol (ethyl) poisoning acute.....	226	14	5		245	63	110		8	45
Alcoholism, chronic (with out psychosis).....	47	25	7		79	5	32			10
All others.....	159					41	63		3	52
Psychiatric diseases:										
Drug addiction without psychosis.....	29	21	12		62	1	9			19
All others.....	370					30	155	7	7	171
Respiratory system, diseases and injuries of (exclusive of tuberculosis):										
Asthma.....	236	72	18	1	327	8	184	3	7	34
Bronchitis.....	634	328	98	3	1,063	123	388	3	1	119
Pleurisy.....	231	115	36	25	407	44	145		6	36
Pneumonia.....	443	71	66	52	632	149	112		154	28
All others.....	49					5	33		4	7
Skin and its appendages, diseases and injuries of:										
Tuberculosis:						231	526	1	11	155
Tuberculosis, pulmonary.....	1,077	111	44	1	1,233	5	267	6	243	556
Tuberculosis (otherwise unclassified).....	72	27	10	32	141	3	33	1	9	26
Tumors:										
Carcinoma.....	290	39	20		349	16	77	6	126	65
All others.....	412					122	174	1	20	95
Veneral diseases:										
Chancroidal infections.....	664	94	13	356	1,127	172	371			121
Gonococcus infections.....	3,153	260	39	76	3,528	383	2,116	2	3	649
Syphilis.....	2,806	844	195		3,845	42	1,841	6	66	851
All others.....	37					10	17			10
Inoculations.....	6									6
Under observation.....	695									695
Miscellaneous:										
Cellulitis.....	214	55	14	47	330	66	99		2	47
All others.....	3,192					776	1,539	5	30	842
Total.....	40,060					8,425	21,181	107	1,285	9,062

NOTE.—Immigration patients at United States Marine Hospital, Ellis Island, N. Y., are not included in this table.

TABLE 5.—Causes of death in United States marine hospitals and other relief stations during fiscal year 1931

International List No.	Cause of death	Number of deaths
<i>I. Epidemic, endemic, and infectious diseases</i>		
1	Typhoid and paratyphoid fever.....	11
5	Malaria.....	1
11	Influenza.....	12
16	Dysentery.....	1
17	Plague.....	1
18	Yellow fever.....	1
20	Leprosy.....	22
24	Meningococcus meningitis.....	3
25	Other epidemic and endemic diseases.....	1
27	Anthrax.....	1
29	Tetanus.....	1
31	Tuberculosis of the respiratory system.....	235
32	Tuberculosis of the meninges and central nervous system.....	5
33	Tuberculosis of the intestines and peritoneum.....	4
34	Tuberculosis of the vertebral column.....	2
35	Tuberculosis of the joints.....	2
36	Tuberculosis of other organs.....	4
37	Disseminated tuberculosis.....	9
38	Syphilis.....	63
40	Gonococcus infection.....	2
41	Purulent infection, septicemia.....	12
<i>II. General diseases not included in Class I</i>		
43	Cancer and other malignant tumors of the buccal cavity.....	7
44	Cancer and other malignant tumors of the stomach and liver.....	51
45	Cancer and other malignant tumors of the peritoneum, intestines, and rectum.....	28
46	Cancer and other malignant tumors of the female genital organs.....	4
49	Cancer and other malignant tumors of other or unspecified organs.....	56
50	Benign tumors and tumors not returned as malignant.....	2
52	Osteoarthritis.....	2
54	Pellagra.....	3
56	Rickets.....	1
57	Diabetes mellitus.....	18
58	Anemia or chlorosis.....	4
60	Diseases of the thyroid gland.....	6
65	Leukemia and Hodgkin's disease.....	5
66	Alcoholism, acute and chronic.....	8
67	Poisoning, chronic, by mineral substances.....	1
<i>III.—Diseases of the nervous system and of the organs of special sense</i>		
70	Encephalitis.....	4
71	Meningitis.....	11
74	Cerebral hemorrhage, apoplexy.....	20
75	Paralysis without specified cause.....	9
76	General paralysis of the insane.....	3
77	Other forms of mental alienation.....	2
78	Epilepsy.....	1
79	Convulsions (nonpuerperal).....	1
84	Other diseases of the nervous system.....	3
86	Diseases of the ear and of the mastoid process.....	4
<i>IV.—Diseases of the circulatory system</i>		
87	Pericarditis.....	1
88	Endocarditis and myocarditis (acute).....	11
89	Angina pectoris.....	4
90	Other diseases of the heart.....	133
91	Diseases of the arteries.....	32
92	Embolism and thrombosis (not cerebral).....	10
93	Diseases of the veins.....	2
95	Hemorrhage without specified cause.....	4
96	Other diseases of the circulatory system.....	3
<i>V.—Diseases of the respiratory system</i>		
97	Diseases of the nasal fossae and their adnexa.....	1
98	Diseases of the larynx.....	1
100	Bronchopneumonia.....	49
101	Pneumonia.....	120
102	Pleurisy.....	6
104	Gangrene of the lung.....	1
105	Asthma.....	5
107	Other diseases of the respiratory system.....	5

TABLE 5.—Causes of death in United States marine hospitals, etc.—Continued

International List No.	Cause of death	Number of deaths
<i>VI.—Diseases of the digestive system</i>		
111	Ulcer of the stomach and duodenum.....	13
112	Other diseases of the stomach.....	1
114	Diarrhea and enteritis.....	3
117	Appendicitis and typhlitis.....	31
118	Hernia.....	13
119	Other diseases of the intestines.....	5
120	Yellow atrophy of the liver (acute).....	1
122	Cirrhosis of the liver.....	10
124	Other diseases of the liver.....	1
125	Diseases of the pancreas.....	3
128	Peritonitis without specified cause.....	3
127	Other diseases of the digestive system (cancer and tuberculosis excepted).....	13
<i>VII.—Nonvenereal diseases of the genitourinary system and adnexa</i>		
128	Nephritis, acute.....	4
129	Nephritis, chronic.....	55
131	Other diseases of the kidneys and adnexa.....	2
133	Diseases of the bladder.....	5
134	Diseases of the urethra, urinary abscess, etc.....	3
135	Diseases of the prostate.....	10
<i>IX.—Diseases of the skin and of the cellular tissue</i>		
151	Gangrene.....	2
153	Abscess, acute.....	1
154	Other diseases of the skin and adnexa.....	4
<i>X.—Diseases of the bones and of the organs of locomotion</i>		
155	Diseases of the bones (tuberculosis excepted).....	2
156	Diseases of the joints (tuberculosis and rheumatism excepted).....	3
<i>XIV.—External causes</i>		
169	Suicide by drowning.....	1
170	Suicide by firearms.....	1
177	Other acute accidental poisonings (gas excepted).....	3
178	Conflagration.....	4
179	Accidental burns (conflagration excepted).....	2
183	Accidental traumatism by firearms.....	2
185	Accidental traumatism by fall.....	2
188	Accidental traumatism by other crushing (vehicles, railways, landslides, etc.).....	2
194	Excessive heat.....	4
197	Homicide by firearms.....	1
201	Fracture (cause not specified).....	35
<i>XV.—Ill-defined diseases</i>		
205	Causes of death not specified or ill-defined.....	5
Total.....		1,285
Causes of death of immigrants at U. S. Marine Hospital, Ellis Island, N. Y., not included above.....		19
Grand total.....		1,304

TABLE 6.—Number of each class of beneficiary discharged from United States marine hospitals and other relief stations during the fiscal year 1931

Group	Class of beneficiary														
	Total	American sea- men	For- eign sea- men	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Missis- sippi River Com- mis- sion	Seamen, U. S. Engineer Corps and Army Trans- port Service	U. S. Light- house Service	U. S. Coast and Geo- detic Survey	U. S. Em- ployees' Com- pen- sation Com- mission	U. S. Vet- erans' Admi- nistration	U. S. Immi- gration Service	U. S. Public Health Service, officers and em- ployees	Lepers	Mis- cel- laneous
Abnormalities and congenital malforma- tions	50	31		5			1			4	9				
Blood and blood-forming organs, dis- eases and injuries of	77	46	2	2						1	25		1		
Bones and cartilages, diseases and in- juries of	2,239	1,247	19	126	3	4	30	19	4	502	258	4	16		7
Circulatory system, diseases and injuries of	1,949	1,041	2	70		2	23	27	4	38	698	7	34		3
Communicable and infectious diseases, not including tuberculosis and venereal	2,279	1,350	25	451	10	4	132	26	14	6	114	26	120		1
Dental	279	143	5	38			7	2		2	81	1			
Digestive system, diseases and injuries of	4,358	2,183	30	428	21	15	114	51	17	18	1,375	14	81		10
Ear, nose, and throat, diseases and in- juries of	4,358	2,386	23	685	4	6	119	42	22	20	869	22	152		3
Endocrines, diseases and injuries of	294	153		18	1		3	3	2	5	104		5		
Eye and adnexa, diseases and injuries of	588	303	9	53	2	1	10	5	3	67	126	1	7		1
Genito-urinary system, diseases and in- juries of (exclusive of venereal)	1,702	1,022	13	134	5	2	70	7	12	26	379	13	18		
Hernia	1,875	1,147	9	46			2	23	16	6	331	284	1	8	2
Joints and bursæ, diseases and injuries of	1,307	629	6	75	2		15	13	2	124	416	2	21		2
Leprosy	51													51	
Lymphatic system, diseases and injuries of	349	249	6	32		1	8	2	1	9	36	3	2		
Muscles, fasciæ, tendons and tendon sheaths, diseases and injuries of	1,233	639	11	124		1	27	15	2	263	124	6	17		4
Nervous system, diseases and injuries of	899	455	4	54	1		15	4		36	314	2	14		
Obstetric and gynecological conditions	29	17					1				4	2	5		
Parasitic diseases	178	75	2	21			4	1		2	67	3	3		
Poisonings and intoxications	432	278	3	26		2	12	3	2	57	42		7		
Psychiatric diseases	399	191		49	1		7	6	3	21	117	1	3		
Respiratory system, diseases and injuries of (exclusive of tuberculosis)	1,593	909	14	111	3	3	35	12	7	9	454	5	27		4
Skin and its appendages, diseases and injuries of	924	533	14	115	4		21	8	1	36	172	7	10		2

Tuberculosis.....	1,149	745	7	40				19	7	2	20	298	7	4		
Tumors.....	702	414	4	35	1	2		17	9	2	16	181	2	19		
Veneral diseases.....	6,660	4,655	61	618	4	2		171	44	21	29	819	226	10		
Inoculations.....	6	1		3							1			1		
Under observation.....	695	273	8	55	2			7	11	2	32	284	8	6	5	2
Miscellaneous.....	3,406	1,933	37	348	4	12	1	65	34	22	639	241	18	48		4
Total.....	40,060	23,048	314	3,762	68	57	11	956	367	151	2,314	7,891	381	639	56	45

NOTE.—Immigration patients at United States Marine Hospital, Ellis Island, N. Y., not included in this table.

TABLE 7.—Number of days in hospital for patients discharged during fiscal year 1931 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' Administration	U. S. Immigration Service	U. S. Public Health Service officers and employees	Lepers	Miscellaneous
Abnormalities and congenital malformations.....	1,456	1,011		126				10			27	282				
Blood and blood-forming organs, diseases and injuries of.....	4,540	2,611	98	185							4	1,636		6		
Bones and cartilages, diseases and injuries of.....	97,102	55,511	470	4,038	75	103		908	702	228	17,086	17,269	33	580		99
Circulatory system, diseases and injuries of.....	102,146	65,193	84	1,858		19		3,394	854	59	543	29,292	88	737		25
Communicable and infectious diseases, not including tuberculosis and venereal.....	36,756	22,858	502	5,153	195	40		2,071	318	231	73	3,925	390	963		37
Dental.....	4,899	2,793	23	513				43	5		16	1,478	28			
Digestive system, diseases and injuries of.....	107,396	48,889	455	7,814	417	248	23	2,272	943	237	216	44,329	248	1,086		219
Ear, nose and throat, diseases and injuries of.....	61,844	34,542	431	8,448	16	29	36	1,251	484	194	277	15,051	235	831		19
Endocrines, diseases and injuries of.....	17,444	9,944		574	8			94	64	533	414	5,753		60		
Eye and adnexa, diseases and injuries of.....	12,111	6,671	83	608	31	3		146	74	16	824	3,559	4	88		4
Genito-urinary system, diseases and injuries of (exclusive of venereal).....	51,410	29,008	209	2,877	65	7	14	2,950	118	150	872	14,546	294	300		
Hernia.....	50,230	31,474	263	1,236			11	970	320	196	7,362	8,202	3	153		40
Joints and bursæ, diseases and injuries of.....	58,370	29,648	45	1,849	333			476	336	11	3,072	21,788	35	733		44
Leprosy.....	67,231														67,231	

TABLE 7.—Number of days in hospital for patients discharged during fiscal year 1931 from United States marine hospitals and other relief stations, etc.—Continued

Group	Class of beneficiary															
	Total	American sea-men	Foreign sea-men	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. Lighthouse Service	U. S. Coast and Geodetic Survey	U. S. Employees' Compensation Commission	U. S. Veterans' Administration	U. S. Immigration Service	U. S. Public Health Service, officers and employees	Lepers	Miscellaneous
Lymphatic system, diseases and injuries of.....	11, 126	7, 723	143	1, 199		29		303	64	11	142	1, 413	52	47		
Muscles, fasciæ, tendons and tendon sheaths, diseases and injuries of.....	22, 943	11, 089	129	1, 670		17		372	151	13	5, 547	3, 530	153	223		49
Nervous system, diseases and injuries of.....	50, 407	30, 699	94	1, 264	8			727	174		1, 224	15, 830	20	367		
Obstetric and gynecological conditions.....	694	459						4				158	22	51		
Parasitic diseases.....	4, 289	1, 735	65	405				37	36			1, 913	38	49		
Poisonings and intoxications.....	6, 255	4, 030	14	155		32		127	3	10	1, 030	808		46		
Psychiatric diseases.....	53, 939	45, 587		2, 963	3			120	121	141	475	4, 280	205	44		
Respiratory system, diseases and injuries of (exclusive of tuberculosis).....	50, 992	31, 940	227	2, 111	31	75		843	825	108	78	13, 968	62	697		27
Skin and its appendages, diseases and injuries of.....	26, 693	16, 496	111	1, 954	67		7	435	76	17	998	6, 308	112	97		15
Tuberculosis.....	188, 734	149, 421	200	7, 760				4, 372	794	69	5, 199	20, 619	192	108		
Tumors.....	27, 891	18, 251	105	652	5	11		811	167	25	533	6, 732	24	575		
Veneral diseases.....	276, 485	202, 183	1, 635	21, 871	44	25		6, 905	2, 551	533	859	32, 353	7, 301	225		
Inoculations.....	21	5		14							1			1		
Under observations.....	5, 628	2, 046	32	503	15			28	106	3	595	1, 703	51	25	512	9
Miscellaneous.....	55, 210	30, 167	508	3, 469	14	59	10	1, 269	477	186	10, 514	7, 682	480	354		21
Total.....	1, 454, 242	891, 984	5, 926	81, 269	1, 327	697	101	30, 938	9, 763	2, 971	57, 992	284, 407	10, 070	8, 446	67, 743	608

NOTE.—Immigration patients at United States Marine Hospital, Ellis Island, N. Y., are not included in this table.

TABLE 8.—Classification of out-patient treatments furnished at United States marine hospitals and other relief stations, fiscal year 1931

	General medical	Dental	Eye, ear, nose, and throat	Neuro-psychiatric	Tuberculosis	Surgical	Veneral diseases	Inoculations and vaccinations	Arsenicals	Physiotherapy and X ray	Total
Marine hospitals.....	51,680	165,146	33,799	110	257	114,111	78,481	3,907	14,691	92,221	554,403
Other relief stations.....	61,352	27,158	14,333	184	532	61,619	23,056	6,200	6,569	25,898	226,901
Special acting assistant surgeons.....	7,236	691	1,917	101	234	4,653	255	1,791	88	41	17,007
Coast Guard vessels and bases.....	53,128	16,121	10,102	47	137	19,264	6,909	4,518	410	1,463	112,099
Emergency.....	42	10						4			56
Grand total.....	173,438	209,126	60,151	442	1,160	199,647	108,701	16,420	21,758	119,623	910,466

TABLE 9.—Nativity of patients discharged from United States marine hospitals and other relief stations during the fiscal year 1931

Nativity	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' Administration	U. S. Immigration Service	U. S. Public Health Service officers and employees	Lepers	Miscellaneous
United States.....	29,230	14,807	13	3,350	61	51	11	812	254	105	1,918	7,251	4	521	32	40
Hawaii, Panama, Philippine Islands, and Porto Rico.....	999	763	2	126		1		29	8	22	25	8	2	7	6	
Armenia.....	9	4									1	4				
Austria.....	198	146	2	3	1			1			13	22	2	8		
Belgium.....	50	35	4	2								5	4			
Bohemia.....	11	7									1	3				
Bulgaria.....	5	3										2				
Canada.....	850	671	6	33	2	1		4	9	2	12	79	21	8	1	1
Central America.....	41	34	1										5			
China.....	78	41	4	2				1	2	2			26			
Cuba.....	36	32		1								3				
Denmark.....	335	261	15	20				2	7	1	1	9	17	2		

TABLE 9.—Nativity of patients discharged from United States marine hospitals and other relief stations during the fiscal year 1931—Contd.

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' Administration	U. S. Immigration Service	U. S. Public Health Service, officers and employees	Lepers	Miscellaneous
Egypt.....	13	11					1						1			
England.....	584	424	34	11	1		9	4		14	45	31	11			
Finland.....	262	232	1	9			8		2	4	1	4		1		
France.....	66	41	4	4				1		4	7	5				
Germany.....	764	600	26	22			12	6	2	25	21	40	10			
Greece.....	210	182	2	2			3			3	12	2	4			
Holland.....	166	135	7	12			1			1	3	6	1			
Hungary.....	26	13		2						3	8					
Indies, East.....	2		1								1					
Indies, West.....	301	271	4	1			1	3	1	2	7	6	2	3		
Ireland.....	564	427	15	7			5	11	1	34	25	6	32	1		
Italy.....	315	127	17	4	1				3	39	109	11	2	2		
Japan.....	27	6	11	2					1			7				
Mexico.....	85	70	1							1	3	5		5		
Norway.....	1,272	1,074	62	24	1		5	80	3	11	8	53	1			
Poland.....	216	107		7			3	2	1	9	82	3	2			
Rumania.....	38	14	1				2	1		5	13	1	1			
Russia.....	216	130	2	9		1	3	2	2	14	46	2	2	1		2
Scotland.....	307	236	15	4		1				6	23	15	7			
Serbia.....	4	2								1	1					
South Africa.....	29	21	2	2					1			2				
South America.....	231	201	8	5			2			3	3	9				
Spain.....	423	383	4	4			7	3		1	5	15		1		
Sweden.....	768	646	22	23	1		14	9		11	12	24	6			
Switzerland.....	49	35	1				2			3	7	1				
Turkey.....	43	30	3					1		1						
All others.....	1,237	826	24	71		2	29	14	2	147	56	50	12	2		2
Total.....	40,060	23,048	314	3,762	68	57	11	956	367	151	2,314	7,891	381	639	56	45

NOTE.—Immigration patients at United States Marine Hospital, Ellis Island, N. Y., not included in this table.

TABLE 10.—Nativity of patients who died in United States Marine Hospitals and other relief stations during the fiscal year 1931

Nativity	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. Lighthouse Service	U. S. Coast and Geodetic Survey	U. S. Employees Compensation Commission	U. S. Veterans' Administration	U. S. Immigration Service	U. S. Public Health Service officers and employees	Lepers	Miscellaneous
United States.....	856	399	-----	18	2	2	-----	33	8	-----	17	347	-----	10	14	6
Hawaii, Panama, Philippine Islands, and Porto Rico.....	23	17	-----	2	-----	-----	-----	1	-----	-----	-----	1	-----	1	1	-----
Austria.....	5	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----
Belgium.....	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----
Canada.....	35	28	2	-----	-----	-----	-----	-----	-----	-----	-----	3	-----	-----	1	1
Central America.....	2	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----
China.....	7	6	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----
Denmark.....	14	11	-----	1	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----
England.....	30	22	-----	2	-----	-----	-----	1	-----	-----	-----	7	-----	-----	-----	-----
Finland.....	23	19	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----
France.....	8	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	-----	-----
Germany.....	18	12	1	-----	-----	-----	-----	1	-----	-----	1	3	-----	-----	-----	-----
Greece.....	8	8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Holland.....	9	7	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Hungary.....	1	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Indies, West.....	13	13	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Ireland.....	25	19	-----	-----	-----	-----	-----	1	1	1	-----	-----	-----	1	-----	-----
Italy.....	6	-----	2	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	2	-----
Mexico.....	3	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----
Norway.....	60	54	3	-----	1	-----	-----	-----	2	-----	-----	-----	-----	-----	-----	-----
Poland.....	5	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Roumania.....	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Russia.....	12	9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Scotland.....	9	6	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
South Africa.....	2	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
South America.....	8	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Spain.....	17	14	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sweden.....	32	26	-----	2	-----	-----	-----	1	2	-----	-----	1	-----	-----	-----	-----
Switzerland.....	1	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----
Turkey.....	4	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
All others.....	46	33	1	2	-----	-----	-----	-----	1	-----	5	2	1	-----	1	-----
Total.....	1,285	733	10	28	3	2	-----	41	16	1	23	377	5	16	23	7

NOTE.—Immigration patients (19) who died at Ellis Island Marine Hospital are not included.

TABLE 11.—Number of discharged American seamen admitted with specified diseases or injuries as a major condition during the fiscal year 1931

Diseases or condition	Number discharged	Diseases or condition	Number discharged
Abnormalities and congenital malformations.....	31	Muscles, Fasciae, tendons, and tendon sheaths, diseases and injuries of.....	639
Blood and blood-forming organs, diseases and injuries of.....	46	Nervous system, diseases and injuries of:.....	
Bones and cartilages, diseases and injuries of.....	1, 247	Epilepsy without psychosis.....	26
Circulatory system, diseases and injuries of:.....		Neuritis.....	149
Heart disease, valvular.....	171	All others.....	280
Varicose veins.....	181	Obstetric and gynecological conditions.....	17
All others.....	689	Parasitic diseases:.....	
Communicable and infectious diseases, not including tuberculosis and venereal:.....		Uncinariasis.....	6
Conjunctivitis, granular trachomatous.....	4	All others.....	69
Dengue.....	2	Poisonings and intoxications:.....	
Influenza.....	603	Alcohol (ethyl) poisoning, acute.....	180
Malaria.....	207	Alcoholism chronic (without psychosis).....	36
Rheumatic fever, acute.....	63	All others.....	62
Typhoid fever.....	44	Psychiatric diseases:.....	
All others.....	427	Drug addiction without psychosis.....	27
Dental.....	143	All others.....	164
Digestive system, diseases and injuries of:.....		Respiratory system, diseases and injuries of (exclusive of tuberculosis):.....	
Appendicitis.....	557	Asthma.....	108
Gastritis.....	191	Bronchitis.....	346
Hemorrhoids.....	376	Pleurisy.....	129
All others.....	1, 059	Pneumonia.....	307
Ear, nose, and throat, diseases and injuries of:.....		All others.....	19
Deviation, nasal septum.....	306	Skin and its appendages, diseases and injuries of.....	533
Otitis media.....	122	Tuberculosis:.....	
Tonsillitis.....	1, 512	Tuberculosis, pulmonary.....	705
All others.....	446	Tuberculosis (otherwise unclassified).....	40
Endocrines, diseases and injuries of.....	153	Tumors:.....	
Eye and adnexa, diseases and injuries of.....	303	Carcinoma.....	184
Genito-urinary system, diseases and injuries of (exclusive of venereal):.....		All others.....	230
Nephritis.....	91	Veneral diseases:.....	
All others.....	931	Chancroidal infections.....	528
Hernia.....	1, 147	Gonococcus infections.....	2, 324
Joints and bursae, diseases and injuries of:.....		Syphilis.....	1, 777
Arthritis.....	383	All others.....	26
All others.....	246	Inoculations.....	1
Lymphatic system, diseases and injuries of:.....		Under observation.....	273
Lymphadenitis.....	225	Miscellaneous:.....	
All others.....	24	Cellulitis.....	144
		All others.....	1, 789
		Total.....	23, 048

DIVISION OF VENEREAL DISEASES

In charge of Asst. Surg. Gen. TALIAFERRO CLARK

The work of this division during the past year more strongly than ever emphasizes the growing importance of the venereal diseases as a major public health problem, shows that many research problems yet remain to be solved, and indicates the increasing menace of venereal diseases to the health of the body politic.

In addition to cooperating with State and local health departments in the control of these diseases, disseminating information on their cause and prevention, carrying on more intensive research, and investigating the incidence and prevalence of syphilis and gonorrhoea in a number of widely separated areas, both rural and urban, it has been possible for this division to extend more active cooperation to other divisions of the service and other Federal bureaus and unofficial agencies in venereal disease work.

SCIENTIFIC RESEARCH

In addition to the clinical and field studies mentioned elsewhere in this report, important research has been continued along the lines followed last year, with such modification as the need therefor developed.

STUDIES AT THE MARINE HOSPITAL, STAPLETON, N. Y.

A large series of latent Wassermann negative luetics have been studied from the standpoint of potential carriers and, consequently, disseminators of syphilis. The work with this group has been practically completed and will be made the subject of a special report. This line of study will be followed by others with representative cases of other classes of luetics.

The search for an efficient prophylactic method has been continued, but as yet with inconclusive results. Some correlated work has been added to this study with the object in view of determining the time required for the *Treponema pallidum* to penetrate the normal mucosa of the rabbit to a depth sufficient for the organism to escape the effect of externally applied spirocheticidal agents.

The possibility of extending to rural and remote districts the advantages to be derived from the early diagnosis of syphilis by the microscopic examination of serum from the primary lesion has been worked out. Essentially, it comprises the use of very fine capillary tubes for the collection of the serum and transportation in suitable containers to a distant laboratory for microscopic examination. This method has been tested out by other observers and at present is in operation in the health department of one State and is under consideration by others.

In view of the importance of securing a single spirochete from indisputable syphilitic material for cultural and animal experimentation, an attempt toward single-cell work with the spirochete has been made. This study has been made possible by the recent development of a dark field condenser so constructed as to permit the introduction of a micromanipulator into a film containing the organism. This apparatus holds out the possibility of a study of cultural methods free from the influence of gross contamination.

Further research on reticulo-endothelial block in relation to the Wassermann titer in rabbits has been continued with some interesting developments. Unfortunately, it has become necessary to suspend the actual work on animals for the purpose of developing a block solution which is as free from organic material, especially proteins, as possible, in order to evaluate the mechanical effect of the particulate substance uncomplicated by the presence of foreign protein.

Some biologic work in gonorrhea has been undertaken for the testing of the therapeutic potency of gonococcus suspensions previously hydrolyzed at various pH levels. Considerable technical difficulties have arisen in connection with this study, especially in the use of indicators suitable for hydrogen ion determination in the low-acid range.

Plans also have been worked out for study of the use of ultra high-frequency currents in experimental syphilis. Preliminary work will be conducted along the lines of its influence on the course of the disease in rabbits, the effect of radiation *in vitro* upon the infectivity of the organism, and the influence of radiation on the serology curve.

STUDIES AT CHICAGO, ILL.

The valuable research on the use of biologic products in the diagnosis and treatment of gonorrhea was continued during the year at Chicago, Ill., in cooperation with the scientific staffs of the John McCormick Institute for Infectious Diseases and the medical department of the University of Illinois, with the advice and assistance of the consultant staff of Cook County Hospital and the University of Illinois dispensary. It is impracticable at this time to attempt to anticipate the results of the studies now in progress. In general these studies are directed along the lines of the biology of the organism, the preparation of various biologic products, and the clinical testing of these products. Although a review of the past 20 years in which biologic products have been used in the treatment of this disease fails to disclose any marked progress in other than the treatment of the metastatic manifestations of this disease, this fact should not preclude further work in this field because of the many avenues of research that have not yet been thoroughly explored.

Studies in the fractioning of the gonotoxin now under way should lead to some definite knowledge with regard to the therapeutic values of this toxin, which seems to differ materially from the toxin produced by the diphtheria and tetanus organisms. The effect of the various protien elements upon the human being, the refinement of methods for their extraction, and more complete knowledge of the factors which influence their production are results which can reasonably be expected from these studies.

The extraction of the carbohydrate fraction from gonotoxin and its use in the diagnosis of gonorrhoea through skin reactions has been widely mentioned in medical literature. It is important that the merit attributed to the use of this product be investigated by an impartial group and that accurate clinical data be collected, as is now being done.

Related studies dealing largely with the refinement of methods for the extraction of the various protein and carbohydrate fractions from the toxin are necessary, because of the limited amount of basic work that has been done along these lines. Unfortunately, this feature of these studies has been somewhat delayed, but a serious difficulty has now been overcome and rapid progress may be reasonably expected.

Other studies now in progress relate principally to the potency of biologic products treated in various ways and the clinical observation of their effect. These studies are carefully controlled.

Moreover, studies on the hydrogenion concentration of the renal excretion during the course of gonorrhoea are being carried out with the object in view of surveying this field for a possible clue to more intensive investigations.

MALARIA TREATMENT OF NEUROSYPHILIS

As a result of studies, carried on over a period of several years, of the principle of specific and nonspecific treatment of general paralysis of the insane, Doctor Wagner-Jauregg, of Vienna, Austria, in 1917, inoculated nine cases of general paralysis of the insane with the parasite of tertian malaria with favorable results. The publication of this experience stimulated world-wide interest in this treatment of a previously uniformly fatal disease, with the result that the Public Health Service has received each year an increasing number of requests for infected material for inoculation purposes. During the year investigations were made in cooperation with the Scientific Research Division to determine the feasibility of supplying the infection from a central depot established by the service, studying some of the problems as yet unsolved that have arisen in connection with this form of treatment and, incidentally, the treatment of malaria. Briefly, these activities thus far have been as follows: Infecting mosquitoes by permitting them to bite malaria patients, to feed on drawn infected blood, to feed on a suspension of salivary gland sporozoites; cultural longevity of the parasites in blood drawn in citrated solution, in relation to the effect of time and manner of handling in their transportation by mail; cultivating the malaria parasite in artificial media; investigating the advantages or possible disadvantages of malaria therapy of the inoculation of blood from one patient to another; extending research studies to include the transportation of live mosquitoes in chilled containers, at prevailing temperatures, both in net cages and in glass containers; and the possibility of the use of material derived from the cultivation of mosquito tissue in artificial media for inoculation purposes.

The importance of these studies is emphasized by the fact that of approximately 70,000 annual admissions to the hospitals for the

insane in this country, something over 11 per cent are cases of general paralysis of the insane caused by syphilitic infection.

Prior to the introduction of this method of treatment the average duration of life of a general paralytic after admission to a hospital was approximately four years. In a recent report submitted by a representative of the British Ministry of Health who has made important contributions to the knowledge of this form of treatment, more than 20 per cent of the total cases treated up to 1929 have been permitted to return to their homes, and over 12 per cent of them are considered as cured.

CLINICAL RESEARCH

COOPERATIVE CLINICAL STUDIES

Important studies of the effect of treatment on early syphilis, made last year in cooperation with a special volunteer committee on clinical research in syphilis, representing five of the leading venereal disease clinics of the United States, were the continuation of a previously arranged program. A report on the first of these studies, Cutaneous and Mucosal Relapse in Early Syphilis and Its Differentiation from Reinfection, was read by a member of the committee before the International Congress of Dermatology and Syphilology which met at Copenhagen, Denmark, August 5 to 9, 1930. One of the practical applications resulting from this study is in connection with the menace of relapses in early syphilis. It is very generally agreed that the cutaneous and mucosal relapses in early syphilis are a greater danger to the public health than the initial lesion, because these lesions are frequently overlooked by the patient and their infectious character not recognized.

In this study of 5,952 cases of early syphilis it was found that 360, or 6.05 per cent, developed mucocutaneous relapses. Moreover, of the relapsed patients, 35 per cent had received less than five doses of arsphenamine. Indeed, 81 per cent of relapsing patients had received less than 15 arsphenamine injections. These are most important determinations, because one of the major problems in the control of syphilis yet to be solved is the securing of treatment of early syphilis adequate to render cases permanently noninfectious.

During the year complete data have been assembled on latent syphilis. These data on 2,000 cases have been so arranged as to measure the effectiveness of treatment in terms of serological and clinical reactions, showing the influence of sex, color, age of the patient, and duration of the infection. The complications of arsenical treatment as well as the treatment failures have been analyzed, information which should prove most valuable to those interested in patients admitted for the treatment of latent syphilis.

Preliminary work was completed on a paper on cases of cardiovascular syphilis treated in the University of Michigan clinic. These data will serve as a pilot paper to the preparation of a study of cases of cardiovascular syphilis treated in the five cooperating clinics.

The major expense of these studies was borne by a special grant made by a philanthropist. At a meeting of the cooperative clinical

group held in New York City on May 6, 1931, it was resolved that the cooperative group under the Committee on Research in Syphilis be dissolved as of July 1, 1931, and be reassembled under the same name, the studies to be carried out under the general direction of the United States Public Health Service, with the promise of financial assistance from and in cooperation with a large foundation.

STUDIES AT THE UNITED STATES MARINE HOSPITAL, ELLIS ISLAND, N. Y.

A clinical study of the biologic treatment of the complications of gonorrhoea was carried out at the United States marine hospital, Ellis Island, N. Y., consisting of observation on the comparative therapeutic effects of the following: Saline suspensions of gonococcal vaccine; commercial antigonococcal serum; gonococcal vaccine sensitized with commercial antigonococcal serum; gonococcal-mixed vaccines, that is, gonococcus, staphylococcus albus and aureus, streptococcus, and colon bacilli; gonococcal-mixed vaccines sensitized with normal human serum; gonococcal-mixed vaccines sensitized with serum from patients convalescing from gonorrhoea; and normal human serum.

It was clearly demonstrated early in the course of this study that the effects of these various products on gonorrhoeal urethritis were generally disappointing and their use was promptly discontinued. Moreover, it was soon demonstrated that but two of these agents—the mixed vaccine sensitized with commercial antigonococcal serum and the mixed vaccine sensitized with serum from patients who are convalescing from gonorrhoea—gave promise of therapeutic effect on the complications of gonorrhoea, as epididymitis, prostatitis, arthritis, and gonorrhoeal ophthalmia. The use of these products caused a uniform and marked systemic reaction when injected intravenously, manifested by chilly sensations, rise in temperature, and relief from acute pain. In general, the results obtained are quite similar to those produced by nonspecific protein treatment, such as typhoid vaccine, milk injections, or similar treatment. The mixed vaccine plus convalescent serum appeared to exercise a more specific effect in the few patients with gonorrhoeal ophthalmia available for study. This study was reported in Venereal Disease Information, Volume XII, No. 1, January 20, 1931.

HOT SPRINGS CLINIC

The number of applicants for treatment at this clinic, maintained by the Public Health Service in cooperation with the National Park Service, for the treatment of indigent cases of venereal disease, was somewhat less than that of the previous year, due in large measure to the inability of many of this class of patients to defray the necessary transportation expenses and subsistence while undergoing treatment. The number of new cases of syphilis and of readmitted cases showed a slight increase, and cases of gonorrhoea, both new and readmitted, increased from the previous year by more than 36 and 32 per cent, respectively. The total number of applicants for relief was 4,881 and the number of treatments administered 66,246. Also 103,619 free baths were given. A summary of the activities of this clinic for the fiscal year 1931 is presented in Table 7.

In addition to the clinical work carried on during the year, 16 practicing physicians were given courses of training in the diagnosis and treatment of the venereal diseases at this clinic—10 white, 5 negro, and 1 Filipino who is employed by the Indian Service. Moreover, six nurses from the Woodmen of the Union Negro Hospital at Hot Springs completed their course of training at the clinic. These activities are practical expressions of important health education procedure. There is a growing conviction to the effect that probably the greatest handicap to the control of the venereal diseases is the lack, or rather inadequacy, of medical treatment and follow-up service in the home. The special training given to physicians and nurses at the Hot Springs clinic is an attempt to overcome in such measure as may be possible the lack of training and experience that to some extent is responsible for the failure of cases of venereal disease to receive adequate treatment.

In addition to these activities, a considerable number of new chemical preparations were investigated for determining their relative value in the treatment of the venereal diseases.

PREVALENCE STUDIES

In May of 1926 a survey of the prevalence of the venereal diseases in representative communities throughout the United States was instituted. These surveys had been carried forward into 30 communities with a total population of approximately one-fourth of continental United States, ranging from towns of less than 25,000 up to the large metropolises with populations in the millions. Several whole States were surveyed. From these surveys a base line has been established for prevalence of the venereal diseases in the United States from which the effectiveness of present-day methods of prevention and control can be measured.

The wide interest excited by these studies that have been carried out by the service in cooperation with State and local public health organizations and the American Social Hygiene Association, to establish, if possible, the prevalence and incidence rates of the venereal diseases in the United States, has resulted in numerous requests for the extension of these studies to include other areas. During the past year surveys have been made, at the request of both State and local health authorities, at Baltimore, Md.; Charleston, W. Va.; and New Orleans, La. The report on the Charleston survey was published in *Venereal Disease Information*, Volume XII, No. 6, June 20, 1931. The data relating to the Baltimore and New Orleans surveys are being rapidly compiled and will appear in report form in the very near future.

During the past year one-half of the originally surveyed communities have been resurveyed in an attempt to discover the trend of venereal disease infection in these communities and, as a corollary, the results of the present methods employed for the control of these diseases. The data so far compiled show that the total gonorrhoea and syphilis rate in one entire State was 4.96 in 1930, in contrast with 4.67 per 1,000 population in 1927, representing a percentage increase of 6.2. These rates are reasonably comparable, inasmuch as in both the 1927 study and in the 1930 resurvey about 88 per cent of the replies to questionnaires were received.

The case rate for syphilis increased in this State from 2.36 per 1,000 population in 1927 to 2.72 per 1,000 population in 1930, an increase of 15 per cent. The gonorrhoea rate decreased from 2.3 per 1,000 population in 1927 to 2.24 in 1930. Paradoxical as it may seem, the increase in the syphilis case rate is gratifying, since it is found largely among the chronic cases, indicating that cases are held under treatment for a longer time.

A resurvey of 14 communities, which included small cities and counties in West Virginia, Kentucky, Illinois, and Arkansas, revealed a decrease of 4.8 per cent in the combined syphilis and gonorrhoea rate (11.94 in 1927 and 11.37 in 1930). However, this decrease was not consistently observed in all of the communities.

Six communities showed increases in the syphilis rate ranging from less than 1 per 1,000 population in some of them to 3 per 1,000 population in others. These increases represent from less than 1 to 75 per cent increase over the previous rates.

In 8 communities showing decreases, the decrease in the syphilis case rate varied from less than 1 per 1,000 to 3 to 4 cases per 1,000 population. These decreases represent from 5 to 50 per cent decrease under the 1927 case rates per 1,000 population.

In addition to resurveying one-half of the communities to determine the trend of the venereal diseases, data were collected also on the number of first admissions to treatment occurring during the month preceding the census day in an attempt to determine the ratio of incidence to prevalence. Ratios based on previous studies are 1.5 for syphilis and 3.54 for gonorrhoea.

In these surveys an effort was also made to determine the effect of immigration on the urban and rural prevalence rates. Except where the rural community was in close proximity, this factor of influence was more or less negligible.

COOPERATION WITH OTHER DIVISIONS OF THE SERVICE

Division of Marine Hospitals and Relief.—Approximately 20 per cent of the total hospital days in marine hospitals are given to the care of venereal diseases among Public Health Service beneficiaries. It is apparent, therefore, that the management and treatment of these cases is a matter of great importance. During the year a specially qualified medical officer of the Division of Venereal Diseases visited the marine hospitals at Baltimore, Boston, Chicago, Louisville, Memphis, New Orleans, New York, Norfolk, and St. Louis for the purpose of studying the facilities for treatment, the methods of treatment employed, the character and extent of the health education program for the instruction of this class of patients, and making recommendation for improvement wherever indicated.

In an attempt to standardize the treatment of syphilis in service hospitals and at the same time obviate the possibility of ill effects of standardization, particularly in the treatment of syphilis, a special case record form has been prepared in collaboration with the chiefs of the respective divisions for use in service hospitals and Federal penal and correctional institutions. Not only does this form lend itself to the actual recording of pertinent clinical data, but it also facilitates the use of a summary or follow-up sheet for recording the treatment given at different stations, to be forwarded to or from

the office of the Surgeon General as needed by the respective hospitals. It is expected that the use of this form will not only be of material assistance to the officers doing the clinical work, but will also give valuable information as to the efficacy of the various modifications of orthodox antisyphilitic treatment that may develop from time to time.

The complexities of modern medical education necessarily limit the amount of instruction given to students on special subjects, notably the diagnosis and treatment of venereal diseases. It has been considered advisable, therefore, to supplement this instruction and to give from time to time, special opportunity for study to a selected few of the junior medical officers of the service who may be called upon to treat venereal diseases at marine hospitals and out-patient relief stations. With this object in view, a special course of instruction in the diagnosis and treatment of these diseases has been worked out in collaboration with the chief of the hospital division which will be given at the Public Health Service venereal disease clinic at Hot Springs, Ark., by the clinic staff, with the volunteer assistance of a number of leading physicians of Hot Springs. It is believed that the extension of these courses as needed will tend to elevate the standard of treatment in service institutions and ultimately result in reducing the number of hospital days for this class of diseases so noticeably responsive to inadequacy of treatment or otherwise.

Division of Mental Hygiene.—The discovery and treatment of the venereal diseases among drug addicts and the inmates of Federal penal and correctional institutions are recognized as important problems confronting the medical staffs of these institutions. The adequacy of the treatment of these diseases not only has an important bearing on the health of this class of inmates but is also of important significance from the standpoint of protection to the public health on their discharge or parole. During the year detailed information was furnished the chief medical officers of all Federal prisons on the diagnosis, classification, treatment, and criteria of noninfectivity of these diseases in both male and female, with the object in view of rendering all prisoners noninfectious as soon as possible, primarily for the protection of society, and secondarily for the continuation of treatment, time permitting, to prevent the occurrence of late crippling manifestations in the individual.

In previous years it has been customary to deny parole to prisoners with a positive blood reaction. Under this new system it is advised that parole be conditioned, unless otherwise prohibited, on the amount of treatment and not necessarily made dependent on the blood reaction. In view of the fact that approximately 16 per cent of the inmates of these institutions thus far examined have a positive Wassermann, it is believed that these changes will not alone have beneficial effect on their health but will also exercise a profound helpful influence on prison morale.

In addition to the cooperative activities in penal and correctional institutions, this division has also collaborated with the Federal Board of Parole of the Department of Justice in working out a plan whereby paroled prisoners in the noninfectious stage of venereal disease may be enabled to obtain the additional treatment necessary to protect them from the late disabling results of such infection.

COOPERATION WITH THE OFFICE OF INDIAN AFFAIRS, DEPARTMENT OF
THE INTERIOR

Reports of undue prevalence of venereal diseases among reservation Indians have long been current. In 1912 the Minnesota State Board of Health requested the assistance of the service in the control of a very prevalent inflammation of the eyes reported among the Indians of the State, which was popularly believed to be venereal but which in reality was trachoma. More recently, during the first two weeks of September, 1930, a health clinic was held at the Red Lake Indian Reservation Agency under the auspices of the Minnesota State Board of Health and the Indian Medical Service. At that time, 1,112 persons were given a complete physical examination, and 676 Indians were serologically examined. Of this number, 119, or 17.6 per cent, were reported as Wassermann positive. These findings forcibly brought the problem of syphilis among the Indians on this reservation to the attention of the Office of Indian Affairs.

On request of the Commissioner of Indian Affairs, a medical officer of this division assisted in the working out of plans and the organization of the mass control of syphilis among the Indians on this reservation similar to an activity carried on by the Public Health Service among Negroes in several southern areas in cooperation with State and local boards of health with the financial assistance of a large foundation. Moreover, this officer revisited this reservation from time to time during the year, on recommendation of the chief medical officer of the Office of Indian Affairs, for conference with the agency physician, with particular reference to treatment methods and follow-up service. It was found that these Indians are more cooperative in this form of health work and more amenable to treatment than was previously thought possible.

STUDY OF SYPHILIS AMONG RURAL NEGROES

The special study of syphilis among Negroes in rural areas, inaugurated in the State of Mississippi in 1929, with the financial assistance of a large philanthropic foundation, has been continued and expanded during the year to include areas in Alabama, Georgia, North Carolina, Tennessee, and Virginia. In several of these States, where the demonstration was planned to be concluded by the end of the fiscal year, it became necessary to continue these activities for a longer period of time in order to complete the prescribed course of treatment of individuals that had been interrupted from time to time by cotton picking, the harvesting of tobacco, and other interferences.

The original plan for study provided for a Wassermann survey of all the members of selected population groups to determine the prevalence of syphilis in the community and to keep those members of the community who gave a positive Wassermann reaction under observation and treatment for a period of one year. In all a total of 28,195 Negroes were tested, and of this number 5,785, or 20.5 per cent, were found syphilitic on the primary survey. Of the 5,785 positive cases uncovered at that time, 4,155, or 71.8 per cent, were placed on intravenous medication. At the close of the fiscal year 1931, 1,603, or 45.1 per cent, of all positive cases had received 15 or more

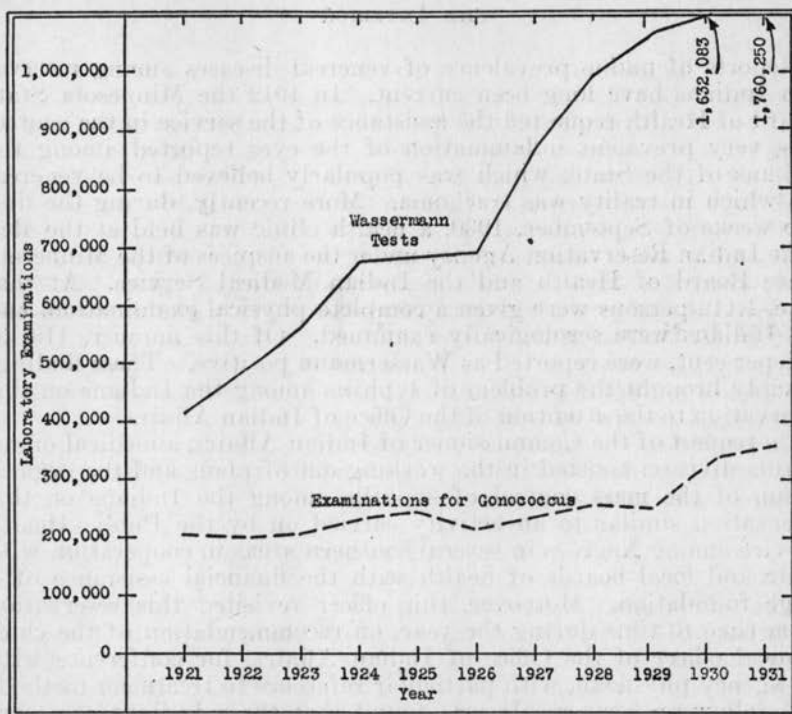


FIGURE 1.—Laboratory examinations reported by State health departments

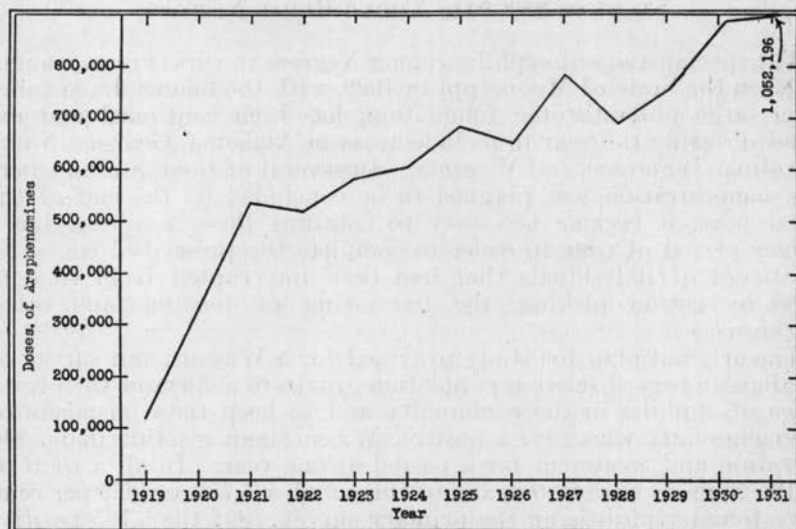


FIGURE 2.—Doses of arsphenamines distributed by State health departments

intravenous treatments considered necessary to render them non-infectious.

In addition to the cases included in the primary survey, a large number of individuals not included in the original group voluntarily presented themselves from time to time throughout the year to have their blood tested. All of these cases who were Wassermann positive were placed on appropriate treatment. Including these individuals, a grand total of 32,049 persons had their blood tested, and 20.5 per cent were found positive. These additional cases are not included in the calculation of the percentage of the total under treatment who had received sterilizing doses of arsphenamine, because obviously time did not permit the completion of the treatment of the majority of them by the close of the year.

It is expected that these and similar studies that may be undertaken in the future will be found useful in determining the true prevalence of syphilis in the rural Negro, demonstrate the feasibility of the mass control of syphilis in this population group, and lay the foundation for the study of the effect of this method of control on the future incidence of this disease and of syphilis as a causative factor in antenatal and neonatal mortality.

HEALTH EDUCATION

The educational activities comprised, as in previous years, the distribution of literature, the loan of moving-picture films, the presentation of papers at scientific meetings and educational conferences, popular lectures before lay groups, and the publication and distribution of the monthly bulletin, Venereal Disease Information. There has been a marked increase in the number of requests for educational material, totaling 17,292, in response to which approximately 160,000 pamphlets and other publications have been distributed to State boards and departments of health and to the public. During the year 206 reels of The Science of Life film were sent to 34 individuals or schools in 18 States.

Numerous testimonials to the character and content of Venereal Disease Information have been received from both domestic and foreign sources. It is gratifying to note that the number of paid subscriptions to this publication increased markedly during the year—by approximately 4,000.

COOPERATIVE ACTIVITIES WITH STATES

There was an increased demand during the year by State health authorities for assistance in the organization and development of venereal disease control work, greatly in excess of the personnel available for such purpose. Members of the field force were actively engaged for varying lengths of time on such duty in Alabama, Georgia, Louisiana, Mississippi, North Carolina, Tennessee, and Virginia.

Forty-three States, in comparison with 44 States for the preceding year, cooperated with the service in reporting on the prevalence of the venereal diseases and the measures employed for their control. The total number of laboratory examinations for the diagnosis and treatment of syphilis and gonorrhoea made in these

States was 2,137,216. Of these, 1,760,250 were serological tests for the diagnosis of syphilis, 8,486 dark field examinations, and 368,480 examinations for the gonococcus, as compared with 1,991,827 such

Year	Disease and Number of Cases	
1919	7,843	<u>CHANCROID</u>
1920	10,861	
1921	13,226	
1922	8,935	
1923	7,777	
1924	8,484	
1925	6,742	
1926	6,812	
1927	6,990	
1928	4,834	
1929	4,762	
1930	5,725	
1931	4,000	
		<u>SYPHILIS</u>
1919	100,466	
1920	142,869	
1921	184,090	
1922	171,824	
1923	172,258	
1924	194,936	
1925	201,692	
1926	205,595	
1927	196,457	
1928	185,437	
1929	195,559	
1930	213,309	
1931	229,310	
		<u>GONORRHEA</u>
1919	131,193	
1920	172,387	
1921	189,927	
1922	152,959	
1923	156,826	
1924	161,676	
1925	166,208	
1926	164,808	
1927	160,793	
1928	147,219	
1929	156,544	
1930	155,875	
1931	155,729	
Year	Disease and Number of Cases	

FIGURE 3.—Cases of venereal diseases reported to State health departments

examinations reported the previous year. Also a total of 1,052,196 doses of the arsphenamines were administered, an increase of approximately 20 per cent over the previous year.

NOTIFICATION OF CASES

During the period July 1, 1930, to June 30, 1931, 389,039 cases of venereal disease were reported by the States, an increase of 3.8 per

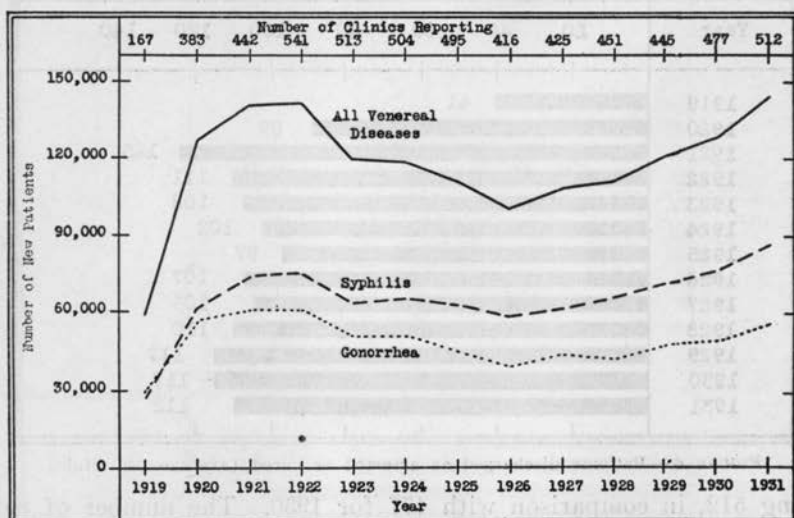


FIGURE 4.—New venereal disease patients admitted to clinics

cent over the number reported in 1930, with one less State reporting. Of this number, 229,310 were cases of syphilis, 155,729 gonorrhea, and 4,000 cases of chancroid, an increase of 7.5 per cent for

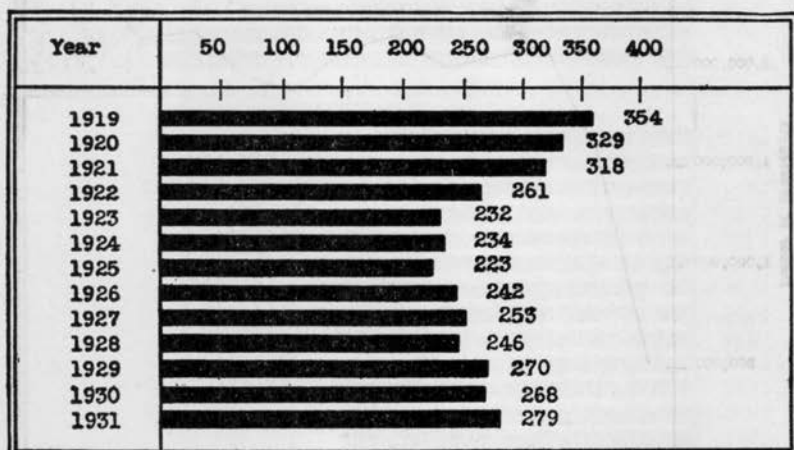


FIGURE 5.—New patients admitted to clinics (average per clinic)

syphilis, a decrease of 0.1 per cent for gonorrhea, and a decrease of 30 per cent in the cases of chancroid reported. While the decrease in gonorrhea reported is almost insignificant, the decrease in chancroid is most striking.

CLINIC ACTIVITIES

There was a gratifying increase in the number of local clinics reporting treatment to the Public Health Service during the year,

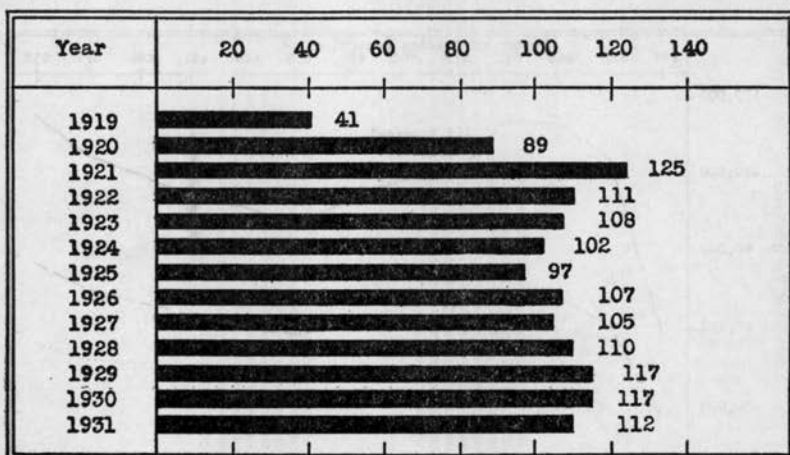


FIGURE 6.—Patients discharged as arrested or cured (average per clinic)

being 512, in comparison with 477 for 1930. The number of new cases admitted to these clinics was 142,915, against 127,978 in 1930, representing an increase of 11.7 per cent. Detailed data with re-

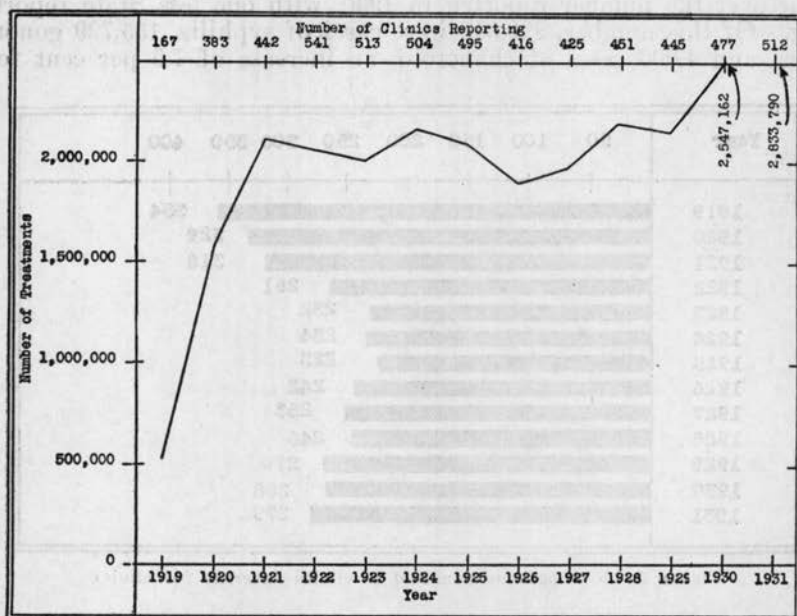


FIGURE 7.—Venereal disease treatments given in clinics

gard to new admissions to clinics, the number of treatments given in clinics per 1,000 inhabitants, are given for each State reporting in Table 5.

TABLE 1.—Activities of State health departments for the control of venereal diseases, July 1, 1930, to June 30, 1931

State	Doses of arsphenamines administered	Laboratory examinations			Number of bulletins and pamphlets distributed	Lectures and film showings	
		Wassermann or other similar tests	Microscopic examinations for Treponema pallidum	Microscopic examinations for gonococcus		Number	Average attendance
Total.....	1,052,196	1,760,250	8,486	368,480	718,771	2,771	85
Alabama.....	74,797	94,264	386	4,536	328		
Arizona ²							
Arkansas.....	15,530	24,446	607	6,444			
California.....	115,918	57,337	349	11,205	27,298		
Colorado.....	5,374	9,882	16	2,433	1,370		
Connecticut ¹	12,814	47,008	30	4,506	10,384	8	68
Delaware.....	5,831	4,269	1	954			
District of Columbia.....	7,883	4,167	23	2,332	2,351		
Florida.....	3,309	3,727		531			
Georgia.....	50,919	62,001	64	2,513	11,279	59	150
Idaho.....	206	10,486		1,917	6,741		
Illinois.....	109,974	85,077	1,434	45,329	49,250	32	180
Indiana.....	34,356	101,500	8	6,395	18,796	5	76
Iowa.....	5,733	2,073	1	2,889			
Kansas.....	7,541	33,395	6	3,190	2,731		
Kentucky.....	22,632	7,908	310	2,005	3,700	21	200
Louisiana.....	8,664	10,323	72	1,247	1,769	56	131
Maine.....	2,486	6,856	158	3,556	5,437	69	71
Maryland.....	31,463	7,860	157	5,156			
Massachusetts.....	75,632	91,773		8,056	65,480	75	62
Michigan.....	40,072	44,670	171	38,915			
Minnesota.....	6,609	63,843	15	11,450	1,872	10	36
Mississippi.....	7,772	33,240		1,239	23,031	16	100
Missouri.....	36,832	32,731	1,308	32,245	4,000		
Montana ²							
Nebraska.....	7,051	26,155	110	4,746	151,175		
Nevada ¹		2,527		882			
New Hampshire.....	2,098	4,750	5	1,475	324		
New Jersey.....	36,258	34,334	629	6,650	52,768	419	74
New Mexico ²							
New York.....	85,697	595,202	743	67,510	150,350	1,046	88
North Carolina ²							
North Dakota.....	97	5,448	6	3,297	19,897	16	157
Ohio.....	62,875	39,913	1,259	12,129			
Oklahoma ²							
Oregon.....	2,836	10,260	24	5,335	914		
Pennsylvania.....	35,228	59,614		13,488	15,097	289	999
Rhode Island.....	9,853	12,868	52	5,725	16,241	10	340
South Carolina.....	4,309	1,178		2,501	2,305		
South Dakota.....		6,813					
Tennessee.....	46,728	42,767	309	6,602	6,862	14	32
Texas.....	18,579	6,680	10	1,924	7,047		
Utah ²							
Vermont.....	1,883	4,908	35	1,466	1,079		
Virginia ¹	15,206	10,493	7	1,709	9,021	11	800
Washington.....	6,509	41,622	105	22,086	455		
West Virginia.....	28,389	7,569	26	2,775	21,199	45	119
Wisconsin.....	6,253	8,293	50	9,137	28,220	580	54
Wyoming ²							

¹ For 11 months.² Not reporting.

TABLE 2.—Cases of venereal disease reported to State health departments and reported venereal disease incidence per 1,000 inhabitants, July 1, 1930, to June 30, 1931

State	Syphilis	Gonorrhea	Chan-croid	All venereal diseases	
				Number of cases	Annual rate per 1,000 inhabitants
Total.....	229,310	155,729	4,000	389,039	3.4
Alabama.....	12,354	5,462	316	18,132	6.9
Arizona.....	156	169	6	331	.8
Arkansas.....	3,709	2,414	4	6,127	3.3
California.....	13,109	10,523	35	23,667	4.2
Colorado.....	822	481	10	1,313	1.3
Connecticut ¹	1,907	1,371	2	3,280	2.2
Delaware.....	1,269	363	80	1,712	7.2
District of Columbia.....	1,171	632	9	1,812	3.7
Florida.....	4,083	680	65	4,828	3.3
Georgia.....	9,145	4,221	192	13,558	4.7
Idaho.....	175	123	6	304	.7
Illinois.....	18,143	18,317	620	37,080	4.9
Indiana.....	2,657	1,818	109	4,584	1.4
Iowa.....	603	402	8	1,013	.4
Kansas.....	846	866	10	1,722	.9
Kentucky.....	3,393	3,909	178	7,480	2.9
Louisiana.....	2,312	1,028	120	3,460	1.6
Maine.....	568	1,064	12	1,644	2.1
Maryland.....	2,328	1,852	152	4,332	2.7
Massachusetts.....	4,188	7,136	.....	11,324	2.7
Michigan.....	16,375	8,262	186	24,823	5.1
Minnesota.....	3,748	3,611	12	7,371	2.9
Mississippi.....	13,317	21,016	.....	34,333	17.1
Missouri.....	3,920	2,652	98	6,670	1.8
Montana ².....	.....	.....	.....	.....	.....
Nebraska.....	1,101	1,557	29	2,687	1.9
Nevada ¹	0	0	0	0	.....
New Hampshire.....	95	102	.....	197	.4
New Jersey.....	7,597	4,175	83	11,855	2.9
New Mexico ².....	.....	.....	.....	.....	.....
New York.....	47,913	16,384	.....	64,297	5.1
North Carolina ².....	.....	.....	.....	.....	.....
North Dakota.....	394	1,139	4	1,537	2.3
Ohio.....	7,326	4,662	496	12,484	1.9
Oklahoma ².....	.....	.....	.....	.....	.....
Oregon.....	578	1,170	11	1,759	1.8
Pennsylvania.....	3,738	3,039	123	6,900	.7
Rhode Island.....	514	461	.....	975	1.4
South Carolina.....	5,805	8,208	95	14,108	8.1
South Dakota.....	391	411	1	803	1.2
Tennessee.....	6,265	2,993	492	9,750	3.7
Texas.....	2,959	850	180	3,989	.7
Utah ².....	.....	.....	.....	.....	.....
Vermont.....	508	556	.....	1,064	3.0
Virginia ¹	2,687	770	50	3,507	1.6
Washington.....	2,955	3,009	62	6,026	3.9
West Virginia.....	17,623	5,951	130	23,704	13.7
Wisconsin.....	563	1,920	14	2,497	.8
Wyoming ².....	.....	.....	.....	.....	.....

¹ For 11 months.² Not reporting.

TABLE 3.—Report of 80 correctional institutions

New cases admitted:	
Syphilis.....	6,600
Gonorrhea.....	3,947
Chancreoid.....	220
Total.....	10,767
Cases discharged as arrested or cured.....	6,957
Treatments given.....	375,825
Doses of arsphenamines administered.....	44,739
Wassermann tests made.....	49,514
Microscopic examinations for gonococcus.....	20,830

TABLE 4.—Report of cooperative clinics furnished through State health departments from July 1, 1930, to June 30, 1931

State and city	Total monthly reports received	New cases admitted				Cases discharged as arrested or cured	Treatments given	Doses of arsenphenamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
Total.....	5,498	142,915	85,400	54,903	2,612	57,414 ¹	2,833,790	782,974	484,787	204,470
Alabama.....	176	14,703	10,702	3,758	243	7,074	198,641	74,797	31,046	4,536
Anniston.....	12	295	246	49	-----	247	4,830	2,171	809	86
Birmingham (2).....	21	3,379	2,532	845	2	2,330	52,837	19,654	6,744	1,288
Decatur.....	12	405	302	103	-----	218	10,472	6,998	2,852	925
Dothan.....	7	205	164	40	1	15	1,515	941	314	18
Eufaula.....	8	261	150	104	7	220	3,566	1,177	67	182
Florence.....	10	119	59	57	3	114	9,792	2,016	-----	-----
Gadsden.....	12	338	203	132	3	224	5,779	1,127	203	95
Huntsville.....	12	415	281	128	6	126	4,359	2,335	1,046	160
Mobile.....	12	2,032	1,505	490	37	666	26,505	6,886	10,341	112
Montgomery.....	12	1,591	1,104	402	85	962	13,319	5,359	905	-----
Selma.....	11	170	165	5	-----	115	2,740	978	496	1
Talladega.....	11	133	108	24	1	5	1,891	888	386	2
Tuscaloosa.....	12	469	319	140	10	367	7,454	1,299	578	317
Tuscumbia.....	12	90	53	37	-----	68	2,288	784	35	26
Cooperative clinicians	12	4,801	3,511	1,202	88	1,397	51,294	22,184	6,270	1,324
Arkansas.....	56	6,014	3,674	2,339	1	5,222	1,192,543	15,155	24,914	6,323
Fort Smith.....	9	45	45	-----	-----	22	524	306	164	5
Hot Springs (2).....	23	4,935	2,888	2,047	-----	5,167	1,184,967	12,373	18,753	5,530
Little Rock.....	12	937	662	275	-----	31	6,876	2,372	5,342	729
Texarkana.....	12	97	79	17	1	2	176	104	655	59
California.....	307	7,527	4,452	3,040	35	2,268	148,965	44,882	25,137	8,851
Alhambra.....	12	37	20	17	-----	15	737	296	110	97
Azusa.....	12	12	12	-----	-----	1	268	46	19	-----
Belvedere (2).....	24	107	88	19	-----	31	2,236	1,338	496	35
Compton.....	12	50	37	13	-----	6	643	355	133	50
El Monte.....	12	33	29	4	-----	2	539	343	106	5
Fresno.....	12	179	88	89	2	226	2,222	898	220	92
Glendale.....	12	34	23	10	1	5	389	124	41	28
Huntington Park.....	12	64	46	17	1	4	1,065	555	169	45
Inglewood.....	12	69	56	13	-----	22	1,396	216	104	12
Los Angeles (3).....	48	3,300	1,854	1,442	4	700	70,518	22,831	8,595	3,670
Monrovia.....	12	9	7	2	-----	2	179	58	54	2
Pomona.....	12	17	16	1	-----	4	616	254	48	1
San Diego.....	12	517	320	197	-----	545	10,737	1,756	1,929	414
San Fernando.....	12	93	60	33	-----	16	1,965	904	286	101
San Francisco (4).....	55	2,027	1,280	720	27	279	44,125	11,770	11,123	3,394
Santa Monica.....	12	44	31	13	-----	59	898	363	238	59
Stockton.....	12	908	464	444	-----	115	9,935	2,473	1,359	798
Whittier.....	12	27	21	6	-----	6	497	302	107	48
Colorado.....	48	759	479	265	15	431	21,804	5,374	2,250	994
Colorado Springs.....	12	39	31	6	2	9	1,048	304	90	33
Denver (2).....	24	621	393	228	-----	374	18,420	4,418	1,873	916
Pueblo.....	12	99	55	31	13	48	2,336	652	287	43
Connecticut.....	85	1,107	526	577	4	583	29,305	7,492	1,676	1,335
Bridgeport.....	10	90	65	25	-----	13	4,891	899	411	121
Hartford.....	11	381	125	254	2	302	8,581	2,777	402	465
New Britain.....	11	90	38	52	-----	13	3,334	899	134	199
New Haven.....	11	140	49	91	-----	41	8,019	1,145	410	177
New London.....	11	33	24	9	-----	17	500	238	64	5
Norwich.....	10	26	25	1	-----	4	388	372	51	11
Stamford.....	10	197	131	64	2	85	1,349	682	150	351
Waterbury.....	11	150	69	81	-----	108	2,243	480	54	6
Delaware.....	40	754	440	244	70	425	10,383	4,733	664	66
Dover.....	10	281	66	161	54	303	1,790	691	-----	-----
Wilmington (3).....	30	473	374	83	16	122	8,593	4,042	664	66

¹ Includes 103,619 baths given patients at the U. S. Public Health Service Clinic at Hot Springs National Park, Ark.

TABLE 4.—Report of cooperative clinics, etc.—Continued

State and city	Total monthly reports received	New cases admitted				Cases discharged as arrested or cured	Treatments given	Doses of arsphenamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhoea	Chancroid					
District of Columbia.....	12	1,812	1,171	632	9	32	22,158	7,883	4,167	2,332
Washington.....	12	1,812	1,171	632	9	32	22,158	7,883	4,167	2,332
Florida.....	24	1,100	775	263	62	322	9,262	3,309	3,727	494
Miami.....	12	701	478	161	62	156	8,671	2,830	2,705	494
Tampa.....	12	399	297	102	—	166	591	479	1,022	—
Georgia.....	72	4,937	3,804	1,104	20	918	111,475	27,926	19,338	667
Atlanta (2).....	24	2,901	2,066	835	—	—	13,526	6,020	11,260	—
Augusta.....	12	233	132	84	17	78	15,974	4,819	3,055	171
Brunswick.....	12	550	550	—	—	10	66,813	7,454	2,092	—
Columbus.....	12	325	234	91	—	1	6,439	2,805	—	—
Savannah.....	12	928	822	94	12	829	8,723	6,828	2,931	496
Illinois.....	275	12,796	6,286	6,282	228	6,879	332,813	106,648	63,558	32,531
Alton.....	12	197	123	70	4	160	9,430	1,396	211	303
Cairo.....	12	108	96	10	2	62	1,443	752	205	12
Calumet City.....	12	11	4	7	—	—	2,088	574	15	—
Chicago (12).....	143	10,780	5,139	5,478	163	5,654	281,534	93,418	60,342	30,344
Decatur.....	12	305	177	126	2	133	8,573	3,183	3,498	248
East St. Louis.....	12	408	215	175	15	314	8,932	660	359	547
Evanston.....	12	130	90	40	—	83	2,505	972	368	213
La Salle.....	12	16	2	14	—	12	435	34	11	20
Litchfield.....	12	19	11	7	1	5	461	202	27	13
Peoria.....	12	294	192	101	1	79	5,185	2,707	610	376
Rockford.....	12	146	67	79	—	59	2,706	697	225	129
Springfield.....	12	382	167	175	40	318	9,521	2,053	687	326
Indiana.....	188	3,423	2,025	1,322	76	1,614	96,912	32,934	7,484	2,840
Anderson.....	12	195	116	79	—	28	5,152	209	235	114
Columbus.....	12	66	52	14	—	74	1,651	343	110	42
Elwood.....	8	15	10	5	—	2	826	106	53	5
Evansville.....	12	641	374	258	9	128	21,505	5,846	1,485	319
Fort Wayne.....	12	296	163	128	5	253	4,349	1,022	320	294
Hammond.....	12	135	96	37	2	56	4,965	1,138	398	27
Indianapolis (2).....	24	566	273	267	26	266	17,566	7,161	1,917	970
Kokomo.....	12	121	76	45	—	16	3,154	1,053	117	22
Madison.....	12	64	16	45	3	42	1,103	132	30	18
Marion.....	12	52	40	12	—	74	1,493	644	90	3
Muncie.....	12	308	172	126	10	246	8,099	4,656	205	91
New Castle.....	12	72	38	34	—	34	1,088	378	74	13
Richmond.....	12	111	95	16	—	5	3,184	1,072	383	36
South Bend.....	12	339	252	87	—	140	10,171	4,962	856	577
Terre Haute.....	12	442	252	169	21	250	12,606	4,212	1,288	309
Iowa.....	93	908	500	400	8	494	21,008	4,109	1,989	2,881
Burlington.....	11	18	14	4	—	6	392	143	18	13
Cedar Rapids.....	12	50	47	3	—	18	1,719	483	280	29
Clinton.....	12	619	324	295	—	276	13,506	2,098	1,192	2,553
Davenport.....	11	27	12	15	—	19	1,047	424	117	108
Des Moines.....	12	64	46	12	6	8	1,456	526	166	18
Dubuque.....	12	65	34	31	—	82	1,612	111	119	34
Ottumwa.....	11	31	9	21	1	79	887	181	60	117
Waterloo.....	12	34	14	19	1	6	389	143	37	9
Kansas.....	35	523	295	222	6	169	11,871	4,353	1,428	866
Kansas City.....	11	174	87	82	5	93	2,146	826	174	146
Topeka.....	12	155	86	68	1	45	5,479	2,093	608	231
Wichita.....	12	194	122	72	—	31	4,246	1,434	646	489
Kentucky.....	238	7,418	3,352	3,889	177	1,761	70,575	22,148	7,679	1,905
Ashland.....	12	165	115	50	—	—	3,046	1,000	326	340
Beverly.....	11	42	8	31	3	33	246	56	44	31
Beattyville.....	2	8	7	1	—	—	46	40	55	1

TABLE 4.—Report of cooperative clinics, etc.—Continued

State and city	Total monthly reports received	New cases admitted			Cases discharged as arrested or cured	Treatments given	Doses of arsenphenamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhoea						Chancroid
Kentucky—Continued.									
Cadiz.....	6	5	3	2	2	37	31	8	
Central City.....	2	6	4	2	1	90	36	9	4
Clinton.....	7	3	3			18	9	11	
Covington.....	12	123	78	45	33	1,642	411	239	173
Danville.....	1	2	2		4	12	2	5	19
Frankfort.....	2	133	75	58	136	412	101	170	
Fulton and Hickman.....	12	31	24	7	2	263	217	100	21
Georgetown.....	7	26	12	9	5	229	134	79	1
Grayson.....	7	19	13	4	2	153	69	66	
Hazard.....	4	142	100	37	5	1,229	730	346	94
Henderson.....	9	54	31	21	2	681	309	109	80
Hyden.....	3	4	1	3		48	24	10	4
Inez.....	3	9	6	3		49	40	13	1
Irvine.....	4	63	33	19	11	346	155	68	23
Jackson.....	7	34	17	15	2	153	99	122	45
Lexington.....	12	1,198	722	351	125	308	16,510	3,920	2,012
Louisa.....	6	10	6	3	1	5	112	55	18
Louisville.....	12	4,355	1,420	2,920	15	810	38,433	10,006	2,306
Middlesboro.....	7	36	36		7	204	204	112	5
Monticello.....	3	6	2	4		53	11	5	5
Neon and Whitesburg.....	11	31	21	10		24	293	133	114
Newport.....	12	58	39	19		15	872	658	70
Owensboro.....	11	86	75	11		27	1,189	634	212
Pikeville.....	6	312	151	158	3	107	1,192	791	322
Pineville.....	12	170	148	22		7	1,161	1,127	199
Prestonburg.....	12	104	82	22			608	446	120
Richmond.....	6	80	62	15	3	15	629	337	246
Salversville.....	2	18	9	9		7	104	38	36
West Liberty.....	3	10	3	7		1	23	12	4
Cooperative clinicians.....	12	75	44	31		26	492	313	123
Louisiana.....									
	12	535	344	191		455	3,574	2,594	597
New Orleans.....									
	12	535	344	191		455	3,574	2,594	597
Maine.....									
	95	656	267	381	8	299	18,377	5,459	3,216
Bangor.....									
	12	130	40	90			1,778	458	189
Bath.....									
	12	27	17	10		8	963	190	31
Bingham.....									
	11	102	20	74	8	78	9,001	3,370	2,087
Calais.....									
	12	69	36	33		98	874	225	104
Lewiston.....									
	12	91	22	69		14	692	185	53
Portland (2).....									
	24	204	128	76		89	4,358	959	674
Presque Island.....									
	12	33	4	29		12	711	72	78
Maryland.....									
	235	4,891	3,008	1,731	152	1,607	100,500	30,825	7,557
Annapolis.....									
	12	147	104	43		40	2,150	768	191
Baltimore (4).....									
	48	3,507	2,214	1,145	148	924	65,856	19,825	4,225
Bel Air.....									
	12	15	15			15	211	180	31
Cambridge.....									
	11	10	7	3			361	238	114
Chestertown.....									
	5	22	22			9	85	59	32
Crisfield.....									
	12	102	52	48	2	49	1,093	509	74
Cumberland.....									
	12	247	111	135	1	113	18,112	3,319	708
Easton.....									
	11	99	92	6	1	75	1,436	1,306	718
Elkton.....									
	12	49	39	10		1	317	197	233
Ellicott City.....									
	12	39	24	15		41	1,136	548	155
Frederick.....									
	12	277	101	176		141	4,314	1,070	389
Hagerstown.....									
	12	132	81	51		74	2,075	1,291	448
Havre de Grace.....									
	12	18	18			14	196	178	36
Hughesville.....									
	9	23	3	20		24	427	64	4
La Plata.....									
	6	27	25	2			126	103	10
Rising Sun.....									
	4	2	1	1		3	56	18	7
Rockville.....									
	9	21	20	1		18	381	128	67
Salisbury.....									
	10	72	58	14		3	788	646	51
St. Mary's City.....									
	2					2	14	14	
Westminster.....									
	12	82	21	61		61	1,416	364	64

TABLE 4.—*Report of cooperative clinics, etc.—Continued*

State and city	Total monthly reports received	New cases admitted				Cases discharged as arrested or cured	Treatments given	Doses of arsenphenamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
Massachusetts	354	6,036	2,915	3,121		1,315	111,672	24,487	20,012	13,863
Boston (10)	102	3,954	1,858	2,096		642	73,571	15,846	11,658	73
Brockton	12	74	41	33		8	2,542	953	249	216
Cambridge (2)	24	42	24	18		6	341	97	23	18
Concord Junction	6	37	7	30		40	525	63	374	3
Fall River (2)	24	100	39	61		24	2,470	266	57	297
Fitchburg	6	22	14	8		2	258	144	14	4
Foxboro	6	16	10	6			4,296	132	219	93
Haverhill	12	62	16	46		33	811	139	41	25
Holyoke	12	52	30	22		1	1,009	190	45	43
Lawrence	12	89	37	52		6	1,024	242	277	14
Lowell	12	195	81	114		111	2,628	568	834	480
Lynn	12	179	73	106		82	2,745	630	398	125
New Bedford	12	342	161	181		73	5,144	985	441	234
Newton	6	3	3			2				
Pittsfield	12	51	28	23		27	563	105	30	32
Pocasset	6	5	5			1	72	42	54	
Quincy	12	17	9	8		7	239	71	19	13
Rutland	6	2	2			5	16	16	105	
Springfield	12	236	127	109		45	4,059	1,299	1,309	34
Taunton	6	21	21				174	57	303	
Tewkesbury	6	184	112	72		83	2,792	463	1,508	1,502
Westboro	6	19	11	8		4	612	266	150	135
Worcester (3)	30	334	206	128		113	5,781	1,913	1,904	502
Michigan	164	8,305	4,575	3,624	106	2,743	228,802	39,775	41,970	38,828
Battle Creek	12	112	51	61		108	1,207	244	201	187
Detroit (4)	48	6,946	3,820	3,028	98	2,122	188,089	31,108	35,691	34,437
Flint	12	371	145	221	5	165	19,048	2,943	1,163	2,283
Grand Rapids	12	139	85	54		16	4,610	712	541	232
Highland Park	12	51	38	13		26	1,731	752	154	
Jackson	12	147	93	52	2	20	3,639	1,118	744	205
Kalamazoo	12	81	56	25		1	1,674	873	162	38
Lansing	12	92	61	31		81	572	113	119	91
Pontiac (2)	20	255	150	104	1	104	6,442	1,262	2,839	1,302
Saginaw	12	111	76	35		100	1,790	650	356	53
Minnesota	46	974	425	548	1	382	23,597	5,368	2,655	945
Duluth	10	527	211	316		178	9,258	1,577	447	482
Minneapolis (2)	24	159	76	83		7	6,163	1,019	714	33
St. Paul	12	288	138	149	1	197	8,176	2,772	1,494	430
Missouri	135	3,336	2,194	1,116	26	754	73,328	15,573	11,573	3,580
Columbia	12	10	9	1			297	119	52	1
Flat River	12	48	31	17		24	1,242	437	180	31
Hannibal	11	50	27	23		14	374	228	149	32
Kansas City (4)	44	1,613	843	760	10	187	27,148	5,144	4,760	2,185
Springfield	12	277	160	103	14	252	5,328	1,182	674	339
St. Joseph	11	327	162	163	2	44	6,700	1,951	516	270
St. Louis (3)	33	1,011	962	49		233	32,239	6,470	5,242	722
Nebraska	36	1,023	539	476	8	237	26,366	6,563	5,583	2,350
Lincoln	12	207	80	127		150	9,766	1,950	1,583	1,807
Omaha (2)	24	816	459	349	8	87	16,600	4,613	4,000	543
New Hampshire	45	114	53	61		64	8,873	2,035	595	478
Concord	12	15	11	4		43	420	96	93	38
Dover	10	11	10	1			359	134	24	1
Manchester	12	80	29	51		20	7,215	1,520	245	417
Nashua	11	8	3	5		1	879	285	233	22
New Jersey	289	7,237	4,044	2,993	200	2,016	149,196	35,650	19,346	6,629
Atlantic City	12	558	340	218			8,050	1,359	831	
Bayonne	12	33	33			1	940	482	989	
Camden	12	60	57	3		2	1,224	717	28	
Elizabeth	10	373	217	156		248	6,368	3,046	725	593
Englewood	12	81	72	9		41	1,684	705	743	151
Greystone Park	12	86	50	36		28	1,376	744	112	10

TABLE 4.—Report of cooperative clinics, etc.—Continued

State and city	Total monthly reports received	New cases admitted				Cases discharged as arrested or cured	Treatments given	Doses of arsenophamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
New Jersey—Contd.										
Hackensack.....	11	109	91	18	-----	76	1,628	677	187	42
Jersey City.....	12	267	125	137	5	65	7,409	2,512	673	467
Long Branch.....	12	130	128	2	-----	22	3,036	911	513	187
Montclair.....	12	113	96	17	-----	-----	3,892	1,175	896	110
Morristown.....	10	84	71	13	-----	-----	1,033	588	207	22
Mount Holly.....	8	35	35	-----	-----	15	438	314	1,035	48
Newark.....	12	2,657	1,477	1,130	50	995	73,903	12,072	6,877	4,104
New Brunswick.....	12	164	116	48	-----	44	2,298	1,596	152	8
Northfield.....	3	32	32	-----	-----	-----	257	77	31	-----
Orange.....	12	458	323	127	8	272	7,696	3,099	3,317	323
Passaic.....	12	89	60	29	-----	-----	1,615	554	165	2
Paterson (2).....	23	232	137	94	1	15	6,504	2,123	551	175
Phillipsburg.....	4	13	9	4	-----	3	95	75	17	-----
Plainfield.....	12	223	206	15	2	87	2,561	620	186	66
Salem.....	12	51	42	9	-----	5	990	262	153	2
Somerville.....	12	25	17	8	-----	14	586	195	32	7
Spring Lake.....	12	58	58	-----	-----	11	1,113	449	155	2
Summit.....	11	13	13	-----	-----	2	352	178	12	-----
Trenton.....	12	1,282	230	918	134	68	13,598	1,067	744	305
Weehawken.....	5	11	9	2	-----	2	550	23	15	5
New York.....	596	7,779	5,628	2,142	9	5,501	189,173	54,038	25,352	6,893
Albany (4).....	43	472	276	195	1	97	15,049	2,924	934	262
Amsterdam.....	12	35	16	18	1	76	1,151	588	56	0
Auburn.....	12	23	14	9	-----	9	753	221	108	57
Beacon.....	12	4	4	-----	-----	4	53	50	130	1
Binghamton.....	12	96	91	5	-----	129	6,064	1,966	565	36
Buffalo (2).....	36	3,012	2,622	387	3	2,339	46,438	9,680	13,836	3,677
Cohoes.....	12	13	12	1	-----	13	77	47	13	2
Corning.....	11	17	12	5	-----	33	699	445	65	3
Dunkirk.....	12	6	6	-----	-----	6	258	126	10	-----
Elmira.....	12	136	87	49	-----	124	3,689	1,418	302	21
Endicott.....	11	28	15	13	-----	18	651	255	63	43
Glens Falls.....	12	56	29	27	-----	3	2,921	1,088	149	87
Gloversville.....	12	27	17	10	-----	18	1,225	537	70	18
Hornell.....	12	28	24	4	-----	62	635	134	83	5
Hudson.....	4	2	2	-----	-----	8	8	8	9	3
Ithaca.....	12	22	16	6	-----	8	772	272	58	10
Jamestown.....	12	88	50	38	-----	43	3,552	1,464	305	120
Johnstown.....	4	6	5	1	-----	5	59	40	7	1
Little Falls.....	8	6	6	-----	-----	11	171	24	5	-----
Mineola.....	12	92	92	-----	-----	19	1,518	1,350	155	5
Mount Vernon.....	12	106	87	19	-----	59	1,981	972	269	35
Newburg.....	12	60	44	16	-----	32	707	542	47	14
New Rochelle.....	12	216	149	66	1	182	5,673	850	434	268
Niagara Falls.....	12	137	108	29	-----	142	4,815	1,771	356	67
Olean.....	12	64	44	20	-----	20	1,397	281	58	7
Oswego.....	12	41	22	19	-----	29	1,457	828	87	40
Plattsburg.....	12	25	9	16	-----	6	373	138	26	26
Port Chester.....	11	53	45	8	-----	86	1,751	685	186	7
Poughkeepsie.....	12	98	80	18	-----	128	2,701	1,002	217	53
Rochester (6).....	72	823	574	248	1	547	32,431	14,288	3,266	596
Rockville Center.....	3	12	12	-----	-----	1	55	45	19	-----
Rome.....	12	25	11	14	-----	23	932	252	80	28
Salamanca.....	6	8	7	1	-----	3	82	10	1	-----
Saratoga Springs.....	12	69	54	14	1	56	892	307	109	44
Schenectady (2).....	24	191	100	91	-----	125	4,160	1,200	145	48
Syracuse.....	12	850	330	520	-----	347	14,763	802	1,442	551
Troy (2).....	16	133	67	65	1	133	5,203	1,483	257	143
Utica.....	12	208	124	84	-----	258	8,939	1,762	696	171
Watertown.....	12	88	76	12	-----	5	2,524	895	99	2
Wellsville.....	12	55	47	8	-----	16	1,586	596	92	1
White Plains.....	11	79	77	2	-----	101	567	384	53	1
Yonkers.....	12	269	165	104	-----	185	10,511	2,318	490	430
North Dakota.....	9	48	17	31	-----	30	638	137	44	186
Minot.....	9	48	17	31	-----	30	638	137	44	186

TABLE 4.—*Report of cooperative clinics, etc.—Continued*

State and city	Total monthly reports received	New cases admitted				Cases discharged as arrested or cured	Treatments given	Doses of arsenphenamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhoea	Chancroid					
Ohio.....	435	11,801	6,758	4,560	483	3,022	225,735	60,756	36,974	11,164
Akron.....	12	605	350	243	12	120	14,413	4,147	1,266	931
Alliance.....	12	19	17	2		4	168	157	25	5
Canton.....	12	190	156	34		29	4,543	1,292	457	126
Chillicothe.....	12	7	7			3	54	46	2	
Cincinnati (2).....	24	2,086	1,348	706	32	34	28,975	6,480	5,730	584
Cleveland (10).....	132	4,275	2,052	1,797	426	1,263	105,600	23,911	17,424	6,353
Columbus (3).....	35	1,377	858	511	8	426	18,880	3,790	4,990	1,981
Dayton (3).....	27	884	526	355	3	163	12,038	5,181	1,222	52
East Liverpool.....	12	109	62	47		53	2,563	686	140	181
Hamilton.....	12	74	72	2		67	608	589	132	27
Ironton.....	2	38	38			1	135	135	70	
Lakewood.....	12	12	11	1		2	279	68	38	15
Lima.....	12	37	25	12			2,755	1,042	159	4
Mansfield.....	3	12	9	1	2	18	312	129	32	2
Marion.....	12	25	22	3		19	558	183	97	2
Middletown.....	12	105	91	14		2	2,689	1,401	289	33
Portsmouth.....	8	180	180			125	2,119	2,029	439	
Port Clinton.....	12	8	6	2			78	14	58	4
Springfield (2).....	24	327	232	95		206	6,249	2,338	955	418
Toledo (2).....	24	1,077	480	597		433	17,468	5,420	1,941	256
Youngstown (2).....	24	354	216	138		54	5,251	1,718	1,508	190
Oregon.....	12	442	282	160		116	8,693	2,836	1,118	1,018
Portland.....	12	442	282	160		116	8,693	2,836	1,118	1,018
Pennsylvania.....	516	6,253	3,521	2,622	110	3,828	54,046	33,815	10,236	
Altoona.....	12	162	123	39		130	3,918	1,556	231	
Beaver Falls.....	12	119	68	51		87	1,450	654	135	
Bedford.....	12	53	26	27		31	449	449	181	
Bellefonte.....	10	43	43				313	256		
Bethlehem.....	12	123	78	43	2	164	2,201	1,606	159	
Butler.....	12	108	59	44	5	58	476	326	123	
Carlisle.....	11	33	25	8			620	566	60	
Chambersburg.....	12	108	65	41	2	121	653	297	140	
Clearfield.....	1	4	3	1		1			5	
Coatesville.....	12	59	46	13		8	555	127	84	
Connellsville.....	12	109	53	56		26	693	368	173	
Du Bois.....	11	102	67	32	3	70	932	784	324	
Easton.....	12	77	51	26			544	445	148	
Erie.....	12	336	181	155		273	2,795	1,769	919	
Hazleton.....	12	48	23	25		41	603	255	98	
Huntingdon.....	12	90	51	34	5	11	852	575	128	
Johnstown.....	12	354	195	154	5	83	2,326	1,953	358	
Lancaster (2).....	24	156	123	33		92	1,649	963	176	
Lebanon.....	12	44	24	20		46	500	177	125	
Lewistown.....	12	93	34	59		72	517	517	116	
Lock Haven.....	5	9					11	11	13	
McKeesport.....	12	252	107	143	2	182	3,041	1,222	405	
Meadville.....	12	15	12	3		7	404	365	202	
Mifflintown.....	3	10	7	3		2	26	22	12	
New Castle.....	12	141	112	28	1	119	1,255	366	133	
Norristown.....	11	74	64	10		75	834	598	147	
Oil City.....	12	77	58	15	4	13	324	282	66	
Philadelphia.....	11	31	4	27		97	63	55	39	
Pittsburgh.....	6	417	211	204	2	298	2,416	1,834	354	
Quakertown.....	3	5	5				29	23	12	
Reading.....	12	547	231	307	9	497	2,505	1,013		
Rochester.....	12	85	74	11		37	767	463	173	
Scranton (2).....	18	426	165	241	20	421	5,568	2,094	919	
Shamokin.....	11	159	72	71	16	3	1,136	902	276	
Sharon.....	12	71	68	3			749	617	97	
Stroudsburg.....	12	43	30	10	3	1	174	124	63	
Sunbury.....	12	117	54	63		59	756	721	134	
Tunkhannock.....	11	10	6	4			38	34	14	
Uniontown.....	9	210	175	35		25	991	409	277	
Warren.....	3	23	21	2			9	6	16	
Washington.....	12	186	90	95	1	105	1,907	1,320	184	
Waynesburg.....	9	31	29	2		1	63	62	61	
West Chester.....	12	119	81	38		41	703	251	195	
West Grove.....	2						20	20	3	

TABLE 4.—Report of cooperative clinics, etc.—Continued

State and city	Total monthly reports received	New cases admitted			Cases discharged as arrested or cured	Treatments given	Doses of arsphe- amines admin- istered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhea						Chancroid
Pennsylvania—Contd.									
Wilkes-Barre (2)	21	570	230	330	10	503	5,504	5,164	2,249
Williamsport	12	91	72	16	3	979	867	207	-----
York	12	313	196	100	17	28	1,728	1,283	302
Rhode Island	72	703	401	302	-----	488	22,191	6,012	11,041
Newport	12	13	10	3	-----	31	400	141	63
Pawtucket	12	73	43	30	-----	30	3,909	835	357
Providence (3)	36	589	330	259	-----	396	17,459	4,906	10,554
Woonsocket	12	28	18	10	-----	31	423	130	67
South Carolina	22	1,988	1,021	883	84	1,178	12,078	3,519	885
Columbia	7	233	129	74	30	118	1,726	655	289
Orangeburg	5	259	147	112	-----	110	1,703	1,283	217
Spartanburg	10	1,496	745	697	54	950	8,649	1,581	379
Tennessee	314	7,492	4,925	2,200	367	2,531	153,856	43,497	41,863
Bolivar	12	53	52	1	-----	7	936	487	198
Brownsville	1	8	8	-----	-----	-----	92	71	18
Cleveland	12	61	28	30	3	22	1,090	394	136
Columbia	1	4	4	-----	-----	-----	12	4	-----
Covington	3	5	5	-----	-----	-----	26	23	17
Dyersburg	12	168	156	12	-----	25	2,068	1,352	337
Elizabethhton	12	101	74	12	15	28	923	599	224
Erwin	2	-----	-----	-----	-----	-----	24	15	14
Franklin	12	26	19	7	-----	24	380	208	134
Gallatin	12	68	46	21	1	2	477	290	43
Gordensburg	7	20	20	-----	-----	2	368	168	86
Greeneville	7	13	12	1	-----	8	222	150	54
Humboldt	12	134	130	4	-----	39	2,139	693	782
Knoxville (2)	24	1,377	655	668	54	151	31,167	8,764	2,490
Lebanon	12	71	64	7	-----	11	705	413	126
Madisonville	12	31	25	4	2	-----	464	245	86
Martin	11	54	50	4	-----	40	771	396	153
Maryville	12	39	38	1	-----	1	1,081	557	286
Memphis	12	2,082	1,414	516	152	1,276	51,248	12,448	20,407
Milan	12	99	82	17	-----	25	1,716	576	467
Murfreesboro	12	59	59	-----	-----	4	727	493	120
Nashville (2)	24	2,499	1,546	817	136	761	50,121	11,444	12,883
Ripaski	7	16	15	1	-----	-----	125	84	27
Ripley	12	43	43	-----	-----	-----	680	598	161
Sevierville	11	13	7	6	-----	1	139	63	61
Sullivan County (3)	8	157	143	11	3	18	1,928	1,154	676
Tiptonville	12	80	70	10	-----	11	1,147	850	322
Trenton	12	145	121	23	1	56	2,374	641	1,422
Union City	12	41	24	17	-----	11	444	165	82
Cooperative clini- cians	4	25	15	10	-----	1	262	144	47
Virginia	76	3,315	2,555	710	50	299	27,933	14,429	10,182
Alexandria	4	51	22	23	6	41	649	260	270
Danville	11	194	168	23	3	54	2,280	1,221	800
Lynchburg	8	281	173	89	19	-----	4,037	2,516	1,980
Newport News	10	231	231	-----	-----	114	1,116	1,085	1,075
Norfolk	10	404	331	63	10	-----	3,970	2,077	1,019
Petersburg	11	416	310	100	6	58	5,478	2,812	993
Richmond	11	1,349	931	412	6	32	10,403	4,458	4,045
University	11	389	389	-----	-----	-----	-----	-----	-----
Washington	36	1,456	759	683	14	958	29,129	6,508	23,070
Seattle	12	1,010	506	490	14	585	17,962	4,449	19,704
Spokane	12	316	188	128	-----	319	8,490	1,165	1,350
Tacoma	12	130	65	65	-----	54	2,677	894	2,016
West Virginia	206	3,124	1,895	1,203	26	983	45,932	21,144	7,569
Beckley	12	152	92	57	3	67	2,785	1,426	376
Charleston	12	633	477	153	3	20	9,600	3,668	1,761
Clarksburg	12	271	131	139	1	155	2,240	1,018	272
Clay	7	26	25	1	-----	11	254	234	41
Fairmont	12	133	86	47	-----	277	2,063	1,124	413

TABLE 4.—Report of cooperative clinics, etc.—Continued

State and city	Total monthly reports received	New cases admitted				Cases discharged as arrested or cured	Treatments given	Doses of arsenphenamines administered	Wassermann tests made	Microscopic examinations for gonococcus
		Total	Syphilis	Gonorrhea	Chancreoid					
West Virginia—Contd.										
Huntington.....	12	543	325	210	8	29	5,795	5,325	1,469	75
Keyser.....	12	65	26	39	1	33	888	192	165	46
Logan.....	12	505	331	173	1	26	5,455	2,336	1,192	51
Madison.....	12	86	31	50	5	62	1,131	289	135	62
Martinsburg.....	11	123	66	57	1	44	1,710	607	108	39
Morgantown (2).....	24	175	74	100	1	117	3,605	1,487	282	172
Moundsville.....	5	42	24	18	1	1	361	148	66	59
New Cumberland.....	12	23	8	13	2	13	712	93	31	8
Parkersburg.....	11	85	56	29	2	29	3,434	1,187	286	163
Webster Springs.....	4	14	14	1	1	2	132	123	47	4
Wellsburg.....	12	36	19	15	2	20	568	217	94	19
Wheeling (2).....	24	212	110	102	1	77	5,199	1,670	831	1,216
Wisconsin.....										
	144	1,626	793	828	5	416	42,386	6,253	8,292	8,921
Beloit.....	12	19	14	4	1	12	274	107	100	186
Janesville.....	12	48	17	30	1	45	1,239	108	227	67
Kenosha.....	12	74	33	41	1	62	1,161	585	248	289
La Crosse.....	12	61	22	39	1	17	1,482	247	241	906
Madison.....	12	173	50	123	3	63	3,921	318	285	806
Milwaukee (3).....	36	1,063	581	479	3	128	30,757	4,225	6,201	94
Oshkosh.....	12	47	26	21	1	5	714	218	392	64
Racine.....	12	64	29	35	1	38	945	219	230	191
Superior.....	12	41	19	22	1	16	1,158	181	342	318
Wausau.....	12	36	2	34	1	30	735	45	26	

NOTE.—States which did not report and those which had no clinics have been omitted from the above table; they are Arizona, Idaho, Mississippi, Montana, Nevada, New Mexico, North Carolina, Oklahoma, South Dakota, Texas, Utah, Vermont, and Wyoming.

TABLE 5.—Annual rate per 1,000 inhabitants of new admissions to clinics and of total treatments given in clinics from July 1, 1930, to June 30, 1931

State	New admissions	Treatments	State	New admission	Treatments
Total.....	1.4	26.9	Montana ²		
Alabama.....	5.6	75.1	Nebraska.....	0.7	19.1
Arizona ¹			Nevada ¹		
Arkansas.....	3.2	103.8	New Hampshire.....	.2	19.1
California.....	1.3	26.2	New Jersey.....	1.8	36.9
Colorado.....	.7	21.1	New Mexico ²		
Connecticut.....	.8	19.9	New York.....	.6	15.0
Delaware.....	3.2	43.6	North Carolina ²		
District of Columbia.....	3.7	45.5	North Dakota.....	.1	.9
Florida.....	.7	6.3	Ohio.....	1.8	34.0
Georgia.....	1.7	38.3	Oklahoma ²		
Idaho ¹			Oregon.....	.5	9.1
Illinois.....	1.7	43.6	Pennsylvania.....	.6	5.6
Indiana.....	1.1	29.9	Rhode Island.....	1.0	32.3
Iowa.....	.4	8.5	South Carolina.....	1.1	6.9
Kansas.....	.3	6.4	South Dakota ¹		
Kentucky.....	2.8	27.0	Tennessee.....	2.9	58.8
Louisiana.....	.3	1.6	Texas ²		
Maine.....	.8	23.0	Utah ²		
Maryland.....	3.0	61.6	Vermont ¹		
Massachusetts.....	1.4	26.3	Virginia.....	1.5	12.6
Michigan.....	1.7	47.3	Washington.....	.9	18.6
Minnesota.....	.4	9.2	West Virginia.....	1.8	26.6
Mississippi ¹			Wisconsin.....	.6	14.4
Missouri.....	.9	20.2	Wyoming ²		

¹ No clinics.

² Not reporting.

TABLE 6.—*Report of cooperative clinic activities furnished through State health departments from 1919 to 1931*

Year	Number of clinics reporting	New cases admitted	Total treatments given	Cases discharged as arrested or cured	Treatments per new case admitted
1919.....	167	59,092	527,392	14,278	8.92
1920.....	388	126,131	1,576,542	34,215	12.50
1921.....	442	140,748	2,108,003	55,467	14.98
1922.....	541	141,279	2,045,232	60,169	14.48
1923.....	513	119,217	1,992,631	55,508	16.71
1924.....	504	118,023	2,147,087	51,658	18.19
1925.....	495	110,372	2,088,494	47,828	18.92
1926.....	416	100,776	1,881,380	44,329	18.67
1927.....	425	107,688	1,964,233	44,701	18.24
1928.....	451	110,756	2,174,832	49,487	19.64
1929.....	445	120,315	2,128,417	52,136	17.69
1930.....	477	127,978	2,547,162	55,592	19.90
1931.....	512	142,915	2,833,790	57,414	19.83

TABLE 7.—*Report of the United States Public Health Service clinic at Hot Springs National Park, Ark., from July 1, 1930, to June 30, 1931*¹

Total applicants.....	4,881
Venereal.....	² 4,137
Nonvenereal.....	744
Syphilis.....	2,776
New cases.....	2,114
Readmitted cases.....	662
Gonorrhea.....	2,312
New cases.....	1,903
Readmitted cases.....	409
Syphilis (new cases).....	2,114
Primary.....	228
Secondary.....	161
Tertiary.....	1,599
Neuro.....	119
Congenital.....	7
Gonorrhea (new cases).....	1,903
Acute.....	61
Chronic.....	1,842
Total treatments given.....	169,865
Arsphenamine.....	14,911
Mercury and bismuth.....	23,459
Special intravenous.....	586
Gonorrhea.....	27,290
Baths.....	103,619

¹ From the annual report of the clinic.² The 4,137 venereal patients represent 5,088 cases.

Examinations.....	47, 847
Physical.....	4, 881
Gynecological.....	1, 056
For treatment control.....	1, 760
Cystoscopic.....	227
Laboratory.....	39, 923
Wassermann tests.....	8, 256
Kahn tests.....	1, 060
Kolmer tests.....	4, 110
Gonococcus smears.....	6, 959
Darkfields.....	485
Icterus indices.....	6, 972
Malaria smears.....	44
Blood chemistry.....	45
Urine analyses.....	11, 500
Renal function tests.....	437
Tissue examinations.....	10
Bacteriological water examinations.....	45
Minor operations.....	694
Bath attendant inspections.....	2, 022

TABLE 8.—*Report of the United States Public Health Service clinic at Hot Springs National Park, Ark., from July 1, 1922, to June 30, 1931*

Year	Number of applicants	Number of cases			Treatments given	Wassermann tests made
		Total venereal diseases	Syphilis	Gonorrhoea		
Total.....	42, 840	32, 992	21, 338	11, 654	593, 170	65, 863
1922.....	2, 720	1, 775	1, 182	593	43, 830	3, 906
1923.....	3, 389	1, 854	1, 326	528	41, 559	4, 329
1924.....	3, 676	2, 186	1, 447	739	50, 683	4, 671
1925.....	3, 411	2, 782	2, 011	771	50, 608	4, 990
1926.....	3, 570	3, 064	2, 211	853	54, 590	5, 460
1927.....	4, 757	3, 682	2, 504	1, 178	58, 489	6, 275
1928.....	5, 467	4, 134	2, 626	1, 508	72, 466	7, 721
1929.....	5, 265	3, 986	2, 512	1, 474	75, 519	12, 714
1930.....	5, 704	4, 441	2, 743	1, 698	79, 180	7, 541
1931.....	4, 881	5, 088	2, 776	2, 312	66, 246	8, 256

TABLE 9.—Statistical summary of activities in the control of venereal diseases for the fiscal years 1930 and 1931

Activity	1931	1930
MEDICAL ACTIVITIES		
A. Cases of venereal diseases reported to State health departments:		
I. Syphilis.....	229,310	213,309
II. Gonorrhoea.....	155,729	155,875
III. Chancroid.....	4,000	5,725
Total.....	389,039	374,909
B. Doses of arsphenamines distributed by State health departments.....	1,052,196	880,276
C. Clinics: ¹		
I. Clinics established during the year.....	55	47
II. Clinics reporting to State health departments.....	512	477
III. Report from clinics: ¹		
a. New cases admitted.....	142,915	127,978
b. Cases discharged as arrested or cured.....	57,414	55,592
c. Treatments given.....	2,833,790	2,547,162
d. Doses of arsphenamines administered.....	782,974	670,464
e. Wassermann tests made.....	484,787	424,989
f. Microscopic examinations for gonococcus.....	204,470	211,356
D. Requests for medical information received by the Public Health Service.....	214	166
EDUCATIONAL ACTIVITIES		
A. Pamphlets:		
I. Requests for pamphlets received by the Public Health Service.....	17,292	14,254
II. Pamphlets distributed—		
a. By the Public Health Service to—		
1. State health departments.....	8,176	16,722
2. Others.....	149,157	136,207
Total.....	157,333	152,929
b. By State health departments.....	718,771	660,810
c. Gross total pamphlets distributed.....	876,104	813,739
Minus pamphlets distributed by the Public Health Service to State health departments.....	8,176	16,722
d. Net total pamphlets distributed.....	867,928	797,017
III. Venereal disease pamphlets issued by the Public Health Service.....	10	7
B. Lectures, exhibits, and film showings:		
I. Lectures, exhibits, and film showings reported by the—		
a. Public Health Service.....	215	28
b. State health departments.....	2,771	3,034
Total.....	2,986	3,062
II. Average attendance reported by the—		
a. Public Health Service.....	87	100
b. State health departments.....	85	74
Total.....	85	74
III. Motion-picture films and exhibits loaned by the Public Health Service to—		
a. State health departments.....		2
b. Others.....	227	228
Total.....	227	230

¹ Clinic data for 1930 were changed from previously published figures because of additional reports.

DIVISION OF MENTAL HYGIENE

In Charge of Asst. Surg. Gen. WALTER L. TREADWAY

The year ended June 30, 1931, marks the first full 12 months' activities of the division under the designation "Division of Mental Hygiene," the name having been changed by legislative act of June 14, 1930,¹ from the "Narcotics Division." The functions of the division as defined in law are both administrative and investigative in character. They include studies and investigations of the nature of drug addiction and the best methods of treatment and rehabilitation of persons addicted to the use of habit-forming drugs; the dissemination of information on methods of treatment and research in this particular field; cooperation with State and local jurisdictions with a view to their providing facilities for the care and treatment of narcotic drug addicts; studies and investigations of the abusive use of narcotic drugs and the quantities of such drugs necessary to supply the normal and emergency medicinal and scientific requirements of the United States; the administration of the two United States narcotic farms authorized in the act of January 19, 1929; the supervising and furnishing of medical and psychiatric services in Federal, penal, and correctional institutions; and studies and investigations of the causes, prevalence, and means for the prevention and treatment of mental and nervous diseases.

STUDIES OF THE NATURE OF DRUG ADDICTION AND METHODS OF TREATMENT

The division has continued to receive individual reports concerning the personal and social characteristics of those apprehended for violation of the narcotic laws. Such information is of value in determining the potential needs respecting facilities for the treatment of those persons addicted to the use of habit-forming narcotic drugs who have committed offenses against the United States and in furnishing important epidemiological data upon the subject.

Studies of the nature of drug addiction with special reference to the mental and physical status of those habituated to the use of drugs have been continued among drug-addict Federal prisoners at the United States penitentiary annex (United States Disciplinary Barracks), Fort Leavenworth, Kans. Studies of the physical characteristics of these persons have revealed a high incidence of focal infection, including oral sepsis, a relatively high incidence of pulmonary tuberculosis, and of venereal diseases. They are also subject to other intercurrent diseases affecting a general population.

During the year a biochemical laboratory was established in connection with the Public Health Service unit at the United States

¹ U. S. Code, Supp. IV, Title 21, sec. 225.

penitentiary annex, Fort Leavenworth, Kans., for the purpose of making studies to determine the more exact nature of the chemico-physiological changes occurring in connection with drug tolerance and addiction. In this connection special studies are being carried on in the treatment of addiction with special reference to the value of protein shock and the value of various forms of anesthetic drugs.

In addition to the special studies being carried on at this unit, the personnel of the Public Health Service detailed there supervises and furnishes the medical and psychiatric services for the prison population.

DISSEMINATION OF INFORMATION

The results of studies conducted last year in an effort to evaluate the past experiences of States and local jurisdictions pertaining to their attempts at solving the medicosocial problem of drug addiction were published as a supplement to the Public Health Reports during the current fiscal year. This compilation, which brought together under one volume a variety of scattered data, met with a cordial reception by those interested in the subject, both in the United States and abroad.

Data dealing with the epidemiological factors of drug addiction in the United States have been assembled and published in the current issues of the Public Health Reports.

During the past year a detailed study of the chemistry of the opium alkaloids has been made by Dr. Lyndon F. Small, consultant in alkaloid chemistry. Plans are being made to publish the work during the next fiscal year. It will be the first publication of this particular character to appear in the English language and will be of considerable value as a reference work to those interested in the growing field of alkaloid chemistry.

STUDIES OF THE ABUSIVE USE AND THE MEDICAL AND SCIENTIFIC NEEDS OF NARCOTIC DRUGS

In an effort to evolve a method of approaching the solution of preventing the abusive use of narcotic drugs and of carrying out the provisions of the act approved June 14, 1930,² relating to the quantities of crude opium, coca leaves, and their salts, derivatives, and preparations, together with such reserves thereof as are necessary to supply the normal and emergency medicinal and scientific requirements of the United States, the Surgeon General called a conference of representative medical, dental, pharmaceutical, veterinary, and other scientific associations and agencies in Washington, D. C., on August 12, 1930. Fifty-two persons attended the conference, representing 21 national organizations.

One result of the conference was information indicating that there is some diversion of narcotic drugs from legitimate channels to satisfy addiction, although the actual extent of such diversions is unknown. It is variable in different parts of the country, and in the same parts of the country at different times. Evidence was also submitted indicating some ill-advised uses of these drugs through

² U. S. Code, Supp. IV, Title 21, sec. 196.

placing considerable quantities of morphine or other dangerous habit-forming drugs in the hands of inexperienced persons for self-medication and the ill-advised combination of opium or its derivatives with other drugs without apparent consideration of the dangers involved. The misuse and diversion of narcotic drugs through the medium of so-called exempt preparations containing these substances were also considered as a potential source of addiction.

It was made evident from the conference that the current legitimate uses of these drugs are variable from time to time and that different parts of the country or even different sections of a community show wide variations in their uses. There is need, therefore, for studies dealing with the advisable and inadvisable current uses and diversions of narcotic drugs as a means for eventually determining the actual medical and scientific requirements.

Recognizing the difficulties of ascertaining the amount of narcotic drugs being diverted from legitimate channels, it seemed more desirable to approach the solution of this situation through the avenue of an educational program. In consequence, a series of articles was prepared under a plan of cooperation among the American Medical Association and the committee on drug addiction of the division of medical sciences of the National Research Council and the Division of Mental Hygiene of the United States Public Health Service. Their object was to reduce the legitimate uses of addiction-producing drugs to the indispensable minimum by replacement, wherever possible, with other remedies that will accomplish the desired results. The first of these articles appeared in the *Journal of the American Medical Association* for March 14, 1931, and others have been run currently, with an occasional editorial upon the importance of the subject.

Another result of the conference pointed to the desirability of undertaking the analysis of hospital uses of these drugs, of the prescriptions on file in pharmacies, and of the records of dispensing physicians as a means for ultimately determining the medicinal and scientific needs. The trend of the discussion hinged upon a possible analysis of information now available to the Bureau of Narcotics which was subject to further study and investigation or could be collected and supplemented through that channel.

On April 28, 1931, Passed Asst. Surg. Joseph Berkson (R) was employed to undertake these special studies with the aid of three statistical clerks, funds having been obtained for this purpose through a supplemental appropriation. The work was carried on through the remainder of the fiscal year in cooperation with the Bureau of Narcotics.

In accordance with law it was necessary to submit a report to the Secretary of the Treasury as of September 1, 1930, dealing with the subject of the medicinal and scientific needs of the country concerning these drugs. Previous studies of the Public Health Service and other agencies were used as a basis for this purpose, the determination being made in terms of raw materials rather than in terms of derivatives consumed.

ADMINISTRATION OF NARCOTIC FARMS

The site for the first narcotic farm, near Lexington, Ky., was selected on March 13, 1930, but title was not acquired by the Treas-

ury Department until March 14, 1931. The delay in acquiring title was occasioned by certain difficulties encountered in obtaining satisfaction for an inherited interest in one parcel of land comprising part of the tract. An old law, since modified, prohibited the expenditure of money on a public project until the title was vested in the Federal Government. Definite and detailed plans for the development of this institution did not begin, therefore, until the spring of 1931. Several consultations on the plans for this project have been held with members of the American Prison Association, the American Hospital Association, and the American Psychiatric Association and with Government and State officials interested in allied problems, and preliminary studies concerning details of equipment and operating costs have been prepared.

A site for the second United States narcotic farm was selected near Fort Worth, Tex., on June 1, 1931, from 114 proposals received, after appropriate advertisement by the Treasury Department and upon receipt of information from the Federal Real Estate Board that no Government-owned property was available in the section of the country chosen as the desirable place to locate the institution.

MEDICAL AND PSYCHIATRIC SERVICES IN FEDERAL PENAL AND CORRECTIONAL INSTITUTIONS

A significant change affecting the individual Federal prisoner occurred during the fiscal year ended June 30, 1931. Under the act of May 15, 1930,³ the United States Public Health Service was authorized to supervise and furnish the medical, psychiatric, and other technical and scientific services in the Federal penal and correctional institutions; a distinct departure from the former policy of having an individual medical organization for each prison.

Pursuant to the comptroller's decision of February 2, 1930, section 2 of the act mentioned is interpreted as providing that the applicable appropriations under the Department of Justice should bear the entire cost of compensation, allowances, and expenses of the personnel of the Public Health Service detailed to the Department of Justice under the terms of the statute, but that such payment shall be in accordance with the laws and regulations governing the personnel of the Public Health Service. The entire cost of this service is to be charged to the Department of Justice appropriations by means of reimbursement of appropriations or allotment of funds. The administrative control of the personnel is to remain with the Public Health Service, and their rates of compensation, the value of allowances whether in kind or commutation thereof, are to be determined under the laws and regulations of the Public Health Service.

The work of organizing the medical and psychiatric service for Federal prisoners was begun on July 1, 1930, through the Division of Mental Hygiene. Regulations covering the relationships to be maintained between the two departments concerned were prepared, and plans and policies evolved.

The policy pursued in connection with the development of this work concerned itself with evolving an organization about a diagnostic clinic that would serve as the center for all medical activities

³ U. S. Code, Supp. IV, Title 18, secs. 751 and 752.

incident to the diagnosis and treatment of individual prisoners. The proposed adjuncts to this diagnostic center, concerned with services to individual prisoners, are essentially as follows: Reception and quarantine wards, general medical wards, general surgical wards, wards for the physically infirm and handicapped who require a minimum of medical supervision, psychiatric wards for the care and observation of the mentally ill, tuberculosis wards for the temporary care, observation, diagnosis, and treatment of the tuberculous, and an out-patient or "sick call" unit.

It was also appreciated that a medical organization for rendering service to the prison population as a group was concerned with problems of sanitation; measures for controlling and preventing the spread of disease; library and research activities; psychiatric problems relating to discipline; dietetics; recreation and general morale; provisions for furnishing medical and hospital supplies, the latter being made possible through transfer of funds for this purpose; and administrative details incident to the conduct of public business.

The functional activities for an appropriately organized medical service for prisoners necessarily embrace the primary and secondary examination of persons newly admitted to prison, medical treatment for those requiring it, and special physical and mental examinations of inmates.

The primary examinations embrace the physical and mental examination of all new inmates, those without diseases or defects being evacuated to the prison after a reasonable time and others, requiring further observation, study, or special treatment, being kept under medical supervision.

The latter activities come within the purview of secondary examinations, embracing such activities as laboratory tests, including X ray; activities with reference to internal medicine; surgery; eye, ear, nose, and throat; dentistry; urological and genito-urological services; and psychiatric and psychological services. To these are added such adjuncts as orthopedic, neurological, and sociological services. All the activities enumerated above are the detailed functions of the diagnostic center, being correlated and coordinated by discussions at staff conferences.

The treatment and observation functions would be further represented by an activity concerned with the care of the ambulant, semiambulant, and bedridden tuberculous prisoners, and with those suffering from psychiatric disorders, including the feeble-minded or defective delinquent, the psychopathic delinquent, the epileptic, the insane, and those showing neurological symptoms of mental ill health, including acute and subacute intoxication and exhaustive states. The activities of a properly organized medical service for prisoners involve further diversification found in the need for dental care, physiotherapy, occupational therapy, prosthetic devices and appliances, pharmaceutical services, and certain administrative details incident and necessary for carrying on this essential work.

The functions of treatment bear a relation not only to the newly arrived inmate, but to those who may already be residents of the prison, and to the sick call and out-patient department, to special examinations and special medical consultations. The examination and treatment activities of the medical service also bear a relation

to the subject of parole, discharge, pardon, transfer, or ultimate disposition of individual prisoners.

The medical activities concerned with the prison population as a group are involved with the subject of diversified and balanced diets; with factors incident to the preparation and distribution of foods; with the preparation and issue of special diets; with sanitation as it relates to water, ventilation, exercise, prevention of disease, and the control of epidemics. Other activities bearing upon the health of prisoners as a group concern themselves with the subject of occupational diseases and occupational hazards, and the prevention of such diseases and hazards in connection with the industrial activities of the prison. The health of the prisoners as a whole bears a relation to the subject of recreation, general morale, and mental, physical, and moral rehabilitation.

Through the assistance and cooperation of the Division of Scientific Research, arrangements were perfected whereby the National Institute of Health conducts serological examinations for syphilis for all Federal penal and correctional institutions except the United States penitentiary at McNeil Island, Washington. The Wassermann tests for that institution are sent to the Public Health Service laboratory at San Francisco, Calif.

Plans have been perfected during the year, through the assistance and cooperation of the Division of Venereal Diseases, to standardize the methods of treatment accorded persons afflicted with venereal diseases who are inmates of the Federal penal and correctional institutions, and the Division of Domestic Quarantine, through its engineering section, has rendered valuable assistance in matters pertaining to sanitary engineering problems.

In undertaking to organize the medical service for the Federal penal and correctional institutions under the control of the Department of Justice, the United States Public Health Service has followed in general the policies outlined above. The development of the organization, however, has been necessarily of a piecemeal fashion owing to the dearth of personnel available. The reports of the activities of the Public Health Service stations at the several prisons under the control of the Department of Justice follow.

United States penitentiary annex, Fort Leavenworth, Kans., (formerly United States Army Disciplinary Barracks).—Surg. Marion R. King, chief medical officer.

The service activities at this station during the past year were in charge of Surg. Justin K. Fuller until May 15, 1931, when he was relieved by Surg. Marion R. King.

The work of organizing the medical department at the United States penitentiary annex, Fort Leavenworth, Kans., has progressed without abatement throughout the entire fiscal year. Its development is reflected in the increase of the Public Health Service personnel, the progress made in equipping the new hospital, the organization of certain divisions or services within the medical department, the establishment of a system of clinical, property, and personnel record keeping, and services rendered to individual prisoners and to the prison population at large.

At the beginning of the fiscal year the medical staff consisted of 1 medical officer on full-time duty and 1 officer on part-time duty. At

the close of the year the medical personnel comprised 5 medical officers on full-time duty, 1 dental officer on full-time duty, 4 consultants on part-time duty, 3 female nurses, on full-time duty, and 4 other Public Health Service personnel.

The hospital building, a new three story, brick structure, was occupied just before the beginning of the fiscal year. At first the medical work was carried out under marked difficulties, owing to inadequate and unserviceable equipment. Practically all of the unserviceable equipment has been replaced by new and modern hospital furniture, equipment, and supplies. The dental clinic has been completely furnished with a dental X-ray unit, three dental chairs, and laboratory and other appliances. During the last month of the year a complete "shock-proof" X-ray unit was installed and is now being used for routine work, and hydrotherapy appliances are being installed. At the close of the year there were available to the medical service a total of 184 hospital beds; 96 for surgical and medical cases, 30 for the tuberculous, 31 for neuropsychiatric cases, and 27 for the reception and quarantine of newly arrived inmates.

For the purpose of standardizing, equalizing, and systematizing the work of the medical department, certain divisions or "services" have been more or less completely organized; namely, the surgical, medical, neuropsychiatric, eye, ear, nose, and throat, urological and venereal disease, dental, X-ray, physiotherapy and hydrotherapy, occupational therapy, sanitary, laboratory, record, and nursing services. It is necessary for some of the medical officers to assume the responsibilities for more than one service. For example, one officer is responsible for the X-ray, physiotherapy, hydrotherapy, and medical services. Another is chief of the surgical, urological and venereal-disease service. Naturally the functions of the various services overlap to a certain extent. Questions persistently arise relative to the proper manner of handling the out-patient and in-patient relief, the conduct of physical examinations, the mental and physical hygiene of the individual prisoner and the prison population at large, and the disposition of problem cases.

The chiefs of the various services are closely associated with the chief medical officer, forming an association designated the "diagnostic clinic." Meetings are held for discussion of the problems mentioned above, instructions issued by the chief medical officer, and the outlining of policies of procedure. It is through the agency of the diagnostic clinic that the activities of the several services are harmonized, controlled, coordinated, and correlated.

Other activities of the medical department making favorable progress at the present time are research studies in drug addiction. Three research projects in biological chemistry are planned in this connection. Practically all the supplies for the biochemical and clinical laboratories are at hand, and as soon as certain carpenter and plumbing work is finished, these laboratories will be complete in all respects.

Some idea of the scope of the medical activities for the fiscal year ending June 30, 1931, may be gathered from the following: During the year there were 2,058 physical examinations made, 2,121 vaccinations against smallpox and typhoid fever, 7,734 dental treatments given, 1,652 patients admitted to the hospital, and 1,612 patients dis-

charged from the hospital, affording 31,147 hospital-relief days during the year. There were, in addition, 35,538 patients reported at sick call, 46,214 treatments given at sick call, 10,142 surgical dressings given, 284 surgical operations performed, 9,557 treatments administered by the urological and venereal disease service, 8,441 treatments and 317 eye glasses prescribed in the eye, ear, nose, and throat clinic, and 967 neuropsychiatric examinations made.

United States penitentiary, Atlanta, Ga.—Surg. J. G. Wilson, chief medical officer.

The supervising and furnishing of medical services at the United States penitentiary, Atlanta, Ga., have been undertaken by the Public Health Service since September 1, 1930, although Surg. J. G. Wilson was detailed as chief medical officer at that institution on July 15, 1930, preparatory to the taking over of the work by the service.

The development of the medical services at this prison during the 10 months of the past fiscal year is reflected in the increase of the Public Health Service personnel and the reorganization of the functions of this important adjunct to prison administration and correctional methods and procedures.

At the time the Public Health Service assumed charge of the work, the medical personnel comprised two full-time physicians, and three part-time visiting consultants. At the close of the fiscal year, in addition to the chief medical officer, the full-time staff included one psychiatrist, one psychologist, and three assistant physicians. One of the latter lives in the hospital, and there is no hour of the day or night when authorized medical and surgical relief is not available.

In addition to the full-time medical and surgical staff, there are part-time visiting consultants available, representing the following specialties: Neurology, psychiatry, surgery, eye, ear, nose, and throat, and urology. These consultants make regular visits at stated intervals.

The dental services are furnished through the dental section of the Public Health Service, and at the close of the year the staff of that clinic consisted of one dental officer and two dental internes, all of whom devote their entire time to this work. The necessity for these services are obvious when it is appreciated that oral sepsis is the source of much invalidism, and the correction of these conditions is an important adjunct to the rehabilitation of criminal offenders. On taking over the work, much of the dental equipment was found to be obsolete and unserviceable, and it is being replaced with adequate equipment and supplies to meet the needs.

The nursing service has been placed under the immediate direction and supervision of a chief nurse and four assistants, all of whom are registered female nurses, and one or more of them are constantly present on the wards of the hospital during the entire 24 hours of the day. The hospital at Atlanta was the first Federal penitentiary to be provided with the services of trained graduate female nurses. The professional atmosphere of the hospital was at once improved. The nursing care of Federal prisoners is supervised and furnished through authorized competent and reliable people in lieu of the nursing care formerly furnished through the medium of

prisoner orderlies. The abuses and favoritisms previously accorded certain ill prisoners immediately ceased. The detail of female nurses to the hospital at the Atlanta Penitentiary was so satisfactory in its results that the policy of supplying similar personnel was adopted by the service for other prison hospitals.

One druggist and one administrative assistant complete the paid personnel on duty in connection with the medical service at this institution. All the personnel enumerated above are employees of the Public Health Service detailed for this special duty.

During the 10-month period significant changes have taken place in the routine of the medical activities. All newly arrived prisoners are examined, mentally and physically, and efforts are made to subject them to a period of quarantine before being evacuated to the prison proper. These examinations are sufficient in detail to form an intelligent opinion of the prisoner's physical and mental status.

These examinations thus far indicate that approximately one-third of all new prisoners suffer from some physical or mental defect that seriously interferes with the prisoner's ability to earn a living, and special care in assigning them to appropriate tasks within the prison is necessary. Approximately 11 in each 100 prisoners admitted have syphilis. The magnitude of this particular problem may be better visualized when the 4,193 admissions during the year are taken into account.

Of the 145 hospital beds available at the close of the year, 70 were devoted to medical and surgical cases, 40 to the temporary care and treatment of tuberculous inmates, comprising a tent colony, 5 for neuropsychiatric cases, and 30 additional beds for the infirm and chronically ill. There were no beds available for the reception or quarantine of newly admitted prisoners. The inadequacy of these facilities have been recognized in part, since 85 additional beds are eventually to be made available by the construction of an annex to the hospital. This additional wing will be completed during the next ensuing fiscal year.

The old, obsolete, and unserviceable hospital equipment and furnishings are being replaced as rapidly as available funds permit, a special appropriation for this purpose having been secured during the year, which is available for expenditure during the fiscal years 1931 and 1932. This fund is to include equipment for the new 85-bed unit under construction.

The facilities available in the so-called tent colony for the temporary care, observation, and emergency treatment of tuberculous inmates is most inadequate, and not in keeping with the best interests of the Government or the prisoner. The tuberculous tent colony has been the subject of special study by experienced officers versed in problems relating to tuberculosis, and the errors of omission and commission should be corrected by providing more suitable housing, recreation, sanitary, and dietetic facilities. This matter has been the subject of a special report to the Department of Justice.

The facilities for the observation and temporary care of mental cases are most inadequate, and additional bed and recreation space should be provided for this purpose, in keeping with modern medical practices, at the earliest date practicable.

At the close of the fiscal year no space was available in the hospital that could be utilized either for the preparation or serving of

special diets prescribed for patients, and no personnel is available for directing this special work.

The foregoing are administrative problems that give promise of solution, some immediately when the annex to the hospital is completed and some more remotely when additional funds shall be made available. There are other problems fully as important and much harder to solve, the chief among which is the lack of adequate facilities for obtaining sociological histories of inmates and the means of utilizing them to the advantage of prisoners when obtained. The necessity for coordination of effort in assigning prisoners to various tasks and a concerted program for the mental, emotional, and physical rehabilitation of prisoners is apparent to the medical service.

Some idea of the scope of the medical activities at this prison during the course of the fiscal year ended June 30, 1931, may be gathered from the following: During the year there were 9,678 physical examinations made; 4,193 vaccinations against smallpox and 5,102 against typhoid fever; 5,804 dental examinations given; 1,826 patients admitted to the hospital and 1,718 patients discharged from the hospital, affording 41,318 hospital relief days during the year. There were, in addition, 57,799 treatments given at sick call. Other medical activities included 425 major surgical operations; 9,288 treatments given in the eye, ear, nose, and throat clinic; and 941 pairs of eye-glasses prescribed and furnished. The urological and venereal disease clinic treated 3,481 persons, giving 19,769 treatments, 11,396 of which were arsenicals for syphilis. The dental clinic gave 33,364 treatments to 14,723 individuals, whereas the X-ray laboratory made 2,372 examinations. There were 5,325 serological examinations conducted during the year, 8,816 additional specimens examined in the clinical laboratory, and 3,024 neuropsychiatric examinations made.

Federal Industrial Institution for Women, Alderson, W. Va.—Acting Asst. Surg. Edda von Bose, chief medical officer.

The responsibility for supervising and furnishing the medical service at the Federal Industrial Institution for Women, Alderson, W. Va., was assumed by the Public Health Service on September 1, 1930, upon the urgent request of the Bureau of Prisons.

At the close of the fiscal year ended June 30, 1931, besides the chief medical officer, there were on full-time duty one dentist and six female nurses of the Public Health Service. Visiting consultants in surgery and eye, ear, nose, and throat work were added to the medical staff. There is need for a full-time psychiatrist, an additional full-time dentist, another nurse, a visiting specialist in urology, and an administrative clerk. It is planned to supply this additional personnel during the next ensuing fiscal year.

When the Public Health Service took over the work at this institution, the hospital equipment was meager and inadequate. During the year new operating-room equipment, including sterilizers, instruments, and the like, was provided and the surgical services were organized. A complete X-ray unit has been installed. Plans have been perfected for the development of an adequately equipped clinical laboratory and dental clinic. The hospital kitchen equipment is inadequate and means for the satisfactory preparation and distribution of food for the patients are not available; garbage disposal is not satisfactory; and the hospital building is in need of paint and other minor repairs incident to its general maintenance.

A system of clinical and personnel record keeping has been established during the year, and special sanitary services were rendered to the institution population as a whole. The latter include measures involving supervisory consultations respecting the water supply, sewage disposal, milk supply, and other sanitary matters including preventive measures for the control of communicable diseases.

At the close of the fiscal year 1931 there was a total of 66 beds under the supervision of the medical service. Of these, 36 were for general medical and surgical cases, 2 for the tuberculous, and 28 for the reception and quarantine of newly admitted inmates. These facilities afforded 13,164 hospital relief days during the last 10 months of the fiscal year.

Every newly admitted inmate spends at least two weeks in the reception and quarantine service, the average admission rate being approximately 27 persons per month. Each is given a complete medical examination and vaccinated against smallpox and typhoid fever, and appropriate treatment is begun. About one-half of those admitted are addicted to the use of habit-forming drugs, about 40 per cent require treatment for syphilis, and 85 per cent require treatment for gonorrhea. During the 10 months period under discussion, 47,510 treatments were given for venereal diseases. Newly arrived inmates, particularly those addicted to the use of habit-forming drugs, usually suffer from oral sepsis, including dental caries, all of which are in need of extensive dental work. Extractions and dentures are needed, and dental prophylaxis and repair are required by practically every inmate.

In addition to the foregoing, the medical services required are varied. They include acute and chronic diseases, both surgical and medical; metabolic disorders; intoxications; infections; neoplastic diseases; disorders of the various organs and systems of organs; and disorders and diseases of the mind, acute and subacute in character, which interfere with the social and industrial adjustment within the institution.

United States penitentiary, Leavenworth, Kans.—Acting Asst. Surg. Charles A. Bennett, acting chief medical officer.

The work of supervising the medical and psychiatric services at the United States penitentiary, Leavenworth, Kans., was undertaken by the Public Health Service on October 1, 1930. Besides the acting chief medical officer, the full-time staff, at the close of the fiscal year, consisted of 2 assistant physicians, 1 dentist, 1 psychiatrist, 1 psychologist, 4 female nurses, a druggist, and an administrative assistant. The services of five part-time consultants, who make regular visits at stated intervals to the institution, representing the specialties of surgery, urology, röntgenology, and eye, ear, nose, and throat, were also being furnished.

During the last nine months of the fiscal year some of the obsolete and unserviceable hospital equipment was replaced. A dental clinic was established, a psychiatric service inaugurated, and a system of clinical and personnel records installed. Plans were inaugurated for the medical examination of newly admitted inmates and a coordinate attempt made to institute a more rounded organization to meet the special needs.

At the close of the year there were 174 hospital beds available at this institution—74 for medical and surgical cases, 22 for the tuberculous, 20 for neuropsychiatric cases, 42 for the chronic infirm and sick, and 16 for the reception and quarantine services.

The necessity for additional hospital equipment and furnishings was apparent early in the year and a special fund was requested for this purpose. At the close of the year, however, no definite action had been taken upon that request.

The hospital facilities at hand afforded 57,532 hospital relief days during the year. A total number of 88,582 persons reported at sick call and 92,977 out-patient treatments were given. There were 791 surgical operations performed; 9,616 treatments given in the eye, ear, nose, and throat clinic, including 163 pairs of eyeglasses prescribed and furnished; 18,969 treatments given for venereal diseases, of which 5,121 were arsenicals for syphilis; and 18,102 dental treatments involving 11,484 individuals. In addition, 16,680 specimens were examined in the clinical laboratory, 2,529 Wassermann tests made, 1,323 prisoners referred to the X-ray laboratory, and 4,405 to the physiotherapy service. There were 2,270 initial physical examinations and 1,127 mental examinations completed. Besides these, 5,096 secondary physical examinations and 1,255 psychiatric examinations were made, not including the 4,628 special medical interviews granted.

United States industrial reformatory, Chillicothe, Ohio.—Passed Asst. Surg. A. J. Aselmeyer, chief medical officer.

The supervision of the medical service for the United States industrial reformatory, Chillicothe, Ohio, was assumed by the Public Health Service February 1, 1931. Besides the chief medical officer, there were on full-time duty, at the close of the fiscal year, 1 psychiatrist, 1 psychologist, 1 dental officer, 3 female nurses, and a medical technician. Two visiting consultants, one for surgery and one for eye, ear, nose, and throat, were employed during the year.

Since assuming the responsibility for the medical service at this institution, there have been 952 new admissions, with an average monthly institution population ranging from 1,400 to 1,750.

At the close of June 30, 1931, there were a total of 77 beds available under the supervision of the medical service. Of these, 55 were for medical and surgical cases and 22 for reception and quarantine of newly admitted inmates. No facilities are available for the temporary care and observation of the tuberculous and none for the neuropsychiatric cases. These facilities, however, will be considerably amplified upon completion of the construction work now under way. A new hospital building will be erected and adequate facilities provided for the temporary care and observation of the tuberculous, for the temporary care of mental cases, and for the reception and quarantine of newly arrived inmates.

The five months' experience of the Public Health Service at this institution indicates that the medical staff should be considerably amplified during the next fiscal year. An additional physician should be employed on full-time duty, and visiting consultants in the specialties of röntgenology, orthopedic surgery, and genito-urinary diseases should also be employed. One dental interne should be added to the staff.

Federal Prison Camp No. 2, Petersburg, Va.—Acting Asst. Surg. Carl I. Pirkle, chief medical officer.

The medical work at this station was taken over by the Public Health Service on April 1, 1931, upon the special request of the Bureau of Prisons. At that time the population of this institution was about 200, and at the end of the fiscal year 1931 it had increased to about 400. The prison camp, which is under construction, will have a total capacity of 600 when completed. The four dormitories planned were completed during the year, but the dining room, kitchen, bakery, and laundry were still under construction, and temporary buildings are being used for these facilities.

When the medical work was assumed by the Public Health Service at this institution, there were no facilities for the care and treatment of the sick and steps were immediately taken to organize a sick bay or unit for this purpose. A temporary building with a capacity of eight beds is being used as an infirmary, and medicines and supplies have been acquired to meet the immediate needs. Plans for the administration building, in course of construction, include facilities for the medical service sufficient to accommodate from 18 to 20 patients and provide adequate space for administrative offices, dispensary, supplies, operating and surgical dressing rooms, and a dental clinic. This building will be ready for occupancy about the middle of the ensuing fiscal year.

In addition to the chief medical officer on full-time duty, there is one male nurse, also on full-time duty. The dental service is furnished through contract on a fee basis. However, if the population of the camp continues to increase it may be necessary to arrange for the employment of a part-time resident dentist.

STUDIES AND INVESTIGATIONS ON THE CAUSES, PREVALENCE, AND MEANS
FOR THE PREVENTION AND TREATMENT OF NERVOUS AND MENTAL
DISEASES

Owing to paucity of funds and dearth of personnel, it has not been possible to inaugurate any field studies in connection with the causes, prevalence, and means for the prevention and treatment of mental diseases, except those incident to the classification, diagnosis, and routine care of the mentally disordered in Federal prisons.

DIVISION OF PERSONNEL AND ACCOUNTS

In charge of Asst. Surg. Gen. C. C. PIERCE

As heretofore, the Division of Personnel and Accounts has supervised all operations of the service relating to personnel, finances, and the maintenance of property records. The organization of the division has remained unchanged during the year, and through a personnel section, a finance section, and a property record section, all matters relating to appointments, separations, and other changes in status of personnel, estimates of appropriations, allotments, and encumbrances, records of expenditures, including administrative audit, and all records of nonexpendable property are administered under the supervision of the Assistant Surgeon General in charge of the division.

Shortly after the beginning of the fiscal year all of the personnel changes made immediately necessary by the passage of the act approved April 9, 1930, had been made. It is becoming apparent that the enactment of this legislation has done much toward further elevating morale of the commissioned personnel.

It is important, however, at this point again to make mention of the present low compensation received by commissioned officers in the entrance grade of assistant surgeon. Under present pay legislation the maximum pay and allowances for an officer in this grade is \$3,158 per annum. Should the officer have no dependents he would receive but \$2,699 per annum. During the past fiscal year, examinations after being rather widely announced were held on eight occasions at Washington, New York, San Francisco, Chicago, and New Orleans. Of those appearing for examination, there were a surprisingly low number of candidates successfully meeting the requisite physical, educational, and professional qualifications. This may be accounted for by reason of the fact that the present low maximum compensation of medical officers in the entrance grade of assistant surgeon does not attract sufficient men of high caliber.

The matter of increased compensation, especially in the lower grades, is believed to be highly important in attracting and retaining the services of young doctors well qualified in their profession.

Condensed reports of the activities of the directors in the six public health districts are listed below, followed by information relevant to the various classes of service personnel, together with a tabulated statement showing the number, class, and location of all personnel on duty July 1, 1931. In the appendix will be found a financial statement showing expenditures from appropriations of the Public Health Service for the fiscal year 1931.

PUBLIC HEALTH DISTRICTS

Public health district No. 1.—Headquarters are located in the Subtreasury Building, Wall, Nassau, and Pine Streets, New York

City. Medical Director E. K. Sprague continued to serve as district director throughout the year. Due to the possibility that the building formerly housing this office at 45 Broadway might be disposed of, it seemed advisable to secure other quarters. Accordingly, in November, 1930, adequate space was found in the Subtreasury Building and the transfer was made, resulting in a saving of \$150 monthly for rent, besides providing considerably more office space, which was much needed.

The district comprises the States of Maine, New Hampshire, Vermont, Massachusetts, New York, Connecticut, Rhode Island, New Jersey, and the Canadian border from Halifax to Buffalo. It contains the most densely populated area of the United States, in which are located approximately one-quarter of all of the activities of the Public Health Service and a corresponding number of personnel.

In this district there are 3 marine hospitals located in the metropolitan area of New York—1 at 67 Hudson Street, 1 at Ellis Island, and 1 at Stapleton, Staten Island. The amount of relief work carried on at these stations has shown an increase during the year, particularly at the marine hospital at Hudson Street and the marine hospital at Ellis Island. Both of these institutions are engaged in work different from that of any other institutions of the service. At Ellis Island during the winter there was a large increase in the number of patients. At Hudson Street there has been a steady and constant increase year by year in the number of patients admitted for treatment. Except for the hospitals located in the metropolitan area there has been a slight general decrease in the relief work of the various other stations in this district. In all probability this is due to the general economic situation and to the fact that many vessels that were the source of beneficiaries of the service have been laid up, and to a certain extent the same is true of sea-going commerce.

Two large quarantine stations are located in this district—one at Rosebank, Staten Island, and the other at Gallops Island, in Boston Harbor. Extensive repairs have been made at the station at Gallops Island, but the station still requires better docking facilities and provision for berthing boats at the island.

There are also two large immigration stations located in the first district—at Ellis Island and at Boston. The immigration work at these stations has kept up by reason of the activities on the part of the Immigration Service in deporting undesirable aliens for various reasons.

This district maintains the most extensive medical service for the Coast Guard found in any portion of the country, and contact with the Coast Guard is very close, as this organization is supplying the Public Health Service with a large proportion of the total number of beneficiaries.

The district director reports satisfactory conditions, both with regard to administration and the care rendered beneficiaries at all first-class stations. Inspections have been continuous throughout the year and all of the larger stations were visited several times during the year.

Surveys of unservicable property have been held continuously throughout the year at all of the larger stations, and surveys have

been sufficiently frequent to keep the amount of unservicable property at a minimum.

Although direct contact with the State health officers in the district has not been extensive, at the same time district headquarters has maintained a personal acquaintanceship with these offices and the relation has been cordial and cooperative.

In the office of the director of the first district the soliciting of proposals for the furnishing of subsistence and other supplies to meet the needs of the four stations located in New York is centrally conducted.

This office also has handled shipments of freight and personal effects of officers of the service going abroad and returning from foreign duty and maintains a disbursing office for salary payments to personnel other than commissioned officers at the larger stations.

Public health district No. 2.—In the second district Medical Director B. S. Warren continued to serve as director throughout the year, with headquarters at Room 415, Customhouse, Baltimore Md. This district includes the States of Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Tennessee, North Carolina, South Carolina, and Georgia.

During the year inspections were made of practically all of the stations and activities of the service in this district; all first-class stations were inspected on two different occasions. The marine hospitals in this district which were inspected are located at Baltimore, Md.; Pittsburgh, Pa.; Norfolk, Va.; Louisville, Ky.; Memphis, Tenn.; and Savannah, Ga. Inspections made by the director also included second-class relief stations in Philadelphia and Washington (D. C.); 20 third-class and 1 fourth-class relief stations; the supply depot at Perry Point, Md.; 11 quarantine stations; 13 immigration stations; and 9 Coast Guard stations along the east coast from Delaware to North Carolina, where part-time acting assistant surgeons are on duty to furnish relief to Coast Guard and Lighthouse Service personnel. Visits were also made to the National Institute of Health in Washington, D. C., and headquarters for malarial-control operations also located in Washington. The trachoma hospital in Richmond, Ky., operated in cooperation with the State health authorities to promote activities for the prevention of trachoma, was inspected.

During the year the director of the second district held numerous conferences with State and local health authorities; with immigration officials, relating to the examination of aliens; with United States Veterans' Bureau Medical officers; with Shipping Board officials, relating to physical examination of seamen prior to enlistment; with the Surgeon General and various other officers of the service, concerning service matters. The director also made several investigations of reported irregularities and served as a member on various boards convened throughout the year.

Public health district No. 3.—Medical Director A. J. McLaughlin continued a director of the third district throughout the year. Headquarters are maintained at 536 Lake Shore Drive, Chicago, Ill. This district includes the States of Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, and North Dakota.

During the year inspections were made of the marine hospitals located at Evansville, Ind.; St. Louis, Mo.; Chicago, Ill.; Cleveland, Ohio.; and Detroit, Mich. Numerous relief stations in this district were likewise inspected. In June an investigation was conducted at Hancock and Houghton, Mich., to determine whether the relief station located at Hancock should be moved to Houghton. It was later decided to continue the station at Hancock. Another investigation was made at Sturgeon Bay, Wis., to determine the advisability of establishing a third-class station at that port. In October an investigation was made at Manitowoc and Two Rivers, Wis., in regard to the limitations of functions between the relief station and the acting assistant surgeon appointed for Coast Guard relief at Two Rivers. At the United States penitentiary at Leavenworth, Kans., an investigation was made of the death of an insane patient.

The director of the third district also rendered material assistance to the service in securing from senior medical students at colleges located in his district applications for appointment as internes at hospitals of the Public Health Service following their graduation. This was accomplished through visits to the schools and addresses to the senior classes and the physical examination of the students who expressed their interest in making application.

On four occasions the director served on boards for the examination of applicants for admission to the regular corps and for promotion to and therein.

During the year the director of this district represented the service at a meeting of the American Academy of Ophthalmologists and Otolaryngologists; at a meeting of the committee of direction, medical section of the American Railway Association; and at a meeting of the American Pharmaceutical Association at French Lick, Ind.

In September, 1930, a complete public health survey was made of the State of Oklahoma and a special report was prepared for publication.¹

Numerous addresses were made during the year, some of which were as follows: At a conference of public health officers in the study of Government relations conducted by the University of Minnesota, the subject being Public Health Administration, with Special Reference to County Health Work; conference of public health and tuberculosis and the combined Medical Society of the Upper Peninsula of Michigan—subject, Rural Hygiene; health officers of Indiana and a joint meeting of the Indiana State Medical Society—subject, Relation of the Organized Medical Professions to the Health Department; officials of the Illinois health departments and State Medical society—subject, Trends in Public Health; Iowa State Conference of Social Work, at Davenport, Iowa; at their annual meeting—subject, The Relation of Social Work to Public Health; the Highland Park Physicians Club, a section of the Wayne County Medical Society, of Detroit, Mich.—Subject, The Relation of the Physician to the Health Department; the annual meeting of the Illinois Medical Association at East St. Louis, Ill.—subject, The Medical Profession and the Health Department; the Annual Conference of Social Work, public health section, at Minneapolis, Minn.—subject, Functions and Limitations of Government in Public Health Education.

¹ Public Health Reports, Mar. 13, 1931.

During the year considerable time was devoted to frequent conferences with the medical officer in charge of the Chicago Marine Hospital and with the district engineer upon service matters and in addition joint conferences were held with the local architects in charge of preparation of plans for the new Federal building in Chicago.

In addition to the work outlined above, a great deal of time was given to liaison work with health officers of States and cities. The director states that his services are very much in demand in this direction, because of his detached position and his unbiased opinion in assisting in the settlement of State and local health problems.

Public health district No. 4.—Medical Director L. L. Lumsden was detailed as director of district No. 4 on January 8, 1931, succeeding Medical Director John McMullen. Headquarters of this district are maintained at 305 Customhouse, New Orleans, La. The fourth district includes the States of Florida, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, and Texas. The director is also authorized by special orders to supervise studies of rural sanitation in the States of Kentucky, Tennessee, and South Carolina.

The director of this district reports that for a period of one month immediately following his detail as director a large proportion of his time was devoted to supervising the parish health unit work in Louisiana, in which enterprise the service is cooperating substantially. Within this period he visited several of the parish health units and traveled to Arkansas, Tennessee, and Mississippi to confer with State and local health officials regarding rural health work.

During March the director, upon the request of the State health officer, visited Austin, Tex., to confer relative to legislative and other public health matters. Conferences were also held with State and local health officers in the States of Mississippi, Kentucky, Arkansas, Florida, and Tennessee.

Several trips were made by the director to the bureau in Washington with respect to public health matters, stopping over on his return at several places in South Carolina, Kentucky, and Tennessee in connection with rural health matters.

During the last part of the year numerous inspections were made of the service stations in the fourth district. Special investigations were made at the marine hospital in New Orleans, La.; at the National Leprosarium at Carville, La.; at Biloxi and Greenville, Miss.; and at Panama City, Fla.

Public health district No. 5.—Medical Director J. C. Perry continued to serve as director of the fifth district throughout the year, with headquarters at 76 New Montgomery Street, San Francisco, Calif. The fifth district includes California, Nevada, Arizona, New Mexico, Utah, and Colorado.

All service stations in the fifth district were inspected during the year. It was found that the officers were conscientiously performing their duties. Several complaints were investigated during the year and special reports made thereon.

The director has the important duty of coordination of efforts in the adjustment of matters of minor service policy arising in the district. This has been effected in the stations around San Francisco by maintaining close personal contact with the different activities.

At other stations this has been effected by discussion of matters on inspection visits and by correspondence at other times.

Conferences were held with the health officer of San Francisco and the State health officer of California, during which some specific subjects pertaining to general sanitation and public health work were discussed.

Cooperation with other Federal agencies has been carried out, and laboratory work has been performed for the Indian Service and the park service in the Department of the Interior, in the Public Health Service laboratory in San Francisco. During the year the service has cooperated with the Department of Justice, and serological examinations were made for the Federal penitentiary at McNeil Island.

During the year meningitis on board ship has been in abeyance and no special investigations were made concerning this disease.

There has been a continuation of the examination and vaccination of personnel for the Alaskan canneries. This is the fifth consecutive year in which this work has been done at the request of the commissioner of health of Alaska. The companies engaged in the operation of these canneries realize the importance of this examination and willingly cooperate to the fullest extent in carrying it out. During the year 3,684 persons were examined, of which 2,585 were vaccinated. There were 10 rejections for communicable diseases, of which number 6 were rejected for venereal diseases.

The director has also been in charge of plague-suppressive measures in California, especially those relating to the control of ground squirrels in the districts around San Francisco in which Federal employees are engaged, and by conferences with horticultural commissioners in other counties relative to rodent-control measures. An important activity in this particular has been the continuance of the rat survey in San Francisco under the director of this district.

The work in the Public Health Service laboratory has also been carried out and supervised by the director.

Public health district No. 6.—Medical Director L. D. Fricks continued to serve throughout the year as director of the sixth district, with headquarters at 216 Grand Trunk Dock, Seattle, Wash. The district includes the States of Washington, Oregon, Idaho, Montana, and Wyoming. General supervision and inspection of service work and stations in Alaska and British Columbia are also a function of the director of this district.

Activities within the district are carried on at relief stations, quarantine stations, immigration stations, and at the field laboratory, Hamilton, Mont. There is only one marine hospital in this district, at Port Townsend, Wash.

Two different official inspections were made of the marine hospital at Port Townsend, and in addition other visits were made during the year. The hospital building is old, but is unusually well kept, and the grounds have recently been greatly improved. At times during the year the hospital has been inadequate to care for all the patients, and at one time it was necessary to hospitalize the excessive cases at the Providence Hospital in Seattle. An investigation was made during the year as to the feasibility of securing a better water supply at the Diamond Point detention station.

On account of the inaccessibility of certain relief and quarantine stations and the pressure of work, the district director was not able to visit all the small stations in his district.

In addition to the duties of district director, Medical Director Fricks served as medical officer in charge of the relief station at Seattle, Wash., and also had supervisory charge of all quarantine and immigration activities on Puget Sound.

Very favorable comment is made by the director concerning the professional ability and the character of services being rendered by acting assistant surgeons on duty at the smaller stations within the district, and especially upon the interest manifested in the work of the service on the part of the officers generally. He states that this is also true of the medical men who have accepted local appointments to perform duty for the service in Alaska.

PERSONNEL

COMMISSIONED OFFICERS

On July 1, 1930, the regular corps consisted of the Surgeon General, 8 Assistant Surgeons General, 26 medical directors, 31 senior surgeons, 98 surgeons, 33 passed assistant surgeons, and 59 assistant surgeons. Of this number, aggregating 256, 2 medical directors, 14 senior surgeons, 6 surgeons, and 2 passed assistant surgeons were on waiting orders. During the fiscal year the following changes occurred in the several grades: By the act of April 9, 1930, entitled "An act to provide for the coordination of the public health activities of the Government, and for other purposes," 4 senior surgeons and 8 surgeons were promoted to medical director, 2 chiefs of divisions at the National Institute of Health were commissioned medical directors, and 1 Assistant Surgeon General of the reserve corps was commissioned a medical director; 5 surgeons were promoted to senior surgeon, 1 senior dental surgeon in the reserve corps was commissioned a senior dental surgeon in the regular corps in the grade of senior surgeon, and 1 senior sanitary engineer in the reserve corps was commissioned a senior sanitary engineer in the regular corps in the grade of senior surgeon; 5 surgeons in the reserve corps were commissioned as surgeon in the regular corps, and 1 acting assistant surgeon and 1 epidemiologist were commissioned as surgeon; 12 sanitary engineers were commissioned as sanitary engineers in the grade of surgeon, and 13 dental surgeons in the reserve corps were commissioned as dental surgeon in the grade of surgeon in the regular corps; 25 assistant surgeons were promoted to passed assistant surgeon; 5 acting assistant surgeons and 1 passed assistant surgeon in the reserve corps were commissioned as passed assistant surgeon, 6 passed assistant dental surgeons in the reserve corps were commissioned as passed assistant surgeon, 4 associate sanitary engineers, and 1 technical assistant in sanitary engineering were commissioned as passed assistant surgeon; and 6 assistant dental surgeons in the reserve corps were commissioned as assistant dental surgeon in the grade of assistant surgeon in the regular corps; 5 internes and 1 dentist were appointed and commissioned as assistant dental surgeon in the grade of assistant surgeon; 1 junior assistant

sanitary engineer was commissioned as an assistant sanitary engineer in the grade of assistant surgeon and 10 chief pharmacists were commissioned as assistant pharmacist in the grade of assistant surgeon; also 3 engineers were appointed and commissioned as assistant sanitary engineer in the grade of assistant surgeon.

In addition to these changes, the following promotions, appointments, resignations, and deaths occurred: 1 Assistant Surgeon General reverted to the rank of medical director, 1 senior surgeon was detailed as an Assistant Surgeon General, 24 candidates for appointment to the grade of assistant surgeon were successful in the entrance examination prescribed by law and regulations of the service and were commissioned in that grade; 3 surgeons were placed on waiting orders because of physical disability; 1 senior surgeon, 1 surgeon on active duty, and 1 surgeon on waiting orders died; 2 passed assistant surgeons and 3 assistant surgeons resigned, 1 assistant surgeon was dismissed from the service, and the commission of 1 assistant dental surgeon was terminated.

On July 1, 1931, after these changes had occurred, the regular corps consisted of the Surgeon General, 8 Assistant Surgeons General, 41 medical directors, 1 pharmacologist director in the grade of medical director, 31 senior surgeons, 1 senior dental surgeon, and 1 senior sanitary engineer in the grade of senior surgeon; 89 surgeons, 13 dental surgeons, and 12 sanitary engineers in the grade of surgeon, 62 passed assistant surgeons, 6 passed assistant dental surgeons, and 5 passed assistant sanitary engineers in the grade of passed assistant surgeons; 53 assistant surgeons, 11 assistant dental surgeons, 4 assistant sanitary engineers, and 10 assistant pharmacists, all in the grade of assistant surgeon—a total of 349 officers. Of this number, 2 medical directors, 14 senior surgeons, 8 surgeons, and 2 passed assistant surgeons were on waiting orders.

At the close of the fiscal year 1931, 3 medical directors, 1 senior surgeon, and 4 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, July 9, 1918, and April 9, 1930; 7 medical directors were on duty as directors of the public health districts; 1 surgeon (as chief surgeon) and 1 passed assistant surgeon were serving on detail to the Bureau of Mines, Department of Commerce; and 1 surgeon and 2 passed assistant surgeons were serving (the surgeon as medical director) on detail to the United States Employees' Compensation Commission. Two medical directors and 1 surgeon were assigned as assistants to the Director, Pan American Sanitary Bureau, Washington, D. C.; 3 senior surgeons and 2 surgeons were serving on detail to the Bureau of Indian Affairs, Department of the Interior, in connection with the control of communicable diseases among the Indians; 1 surgeon was serving (as alienist and medical officer) on detail to the Morningside Hospital, near Portland, Oreg., which cares for the Alaska insane under contract with the Department of the Interior; 1 passed assistant surgeon was serving on detail with the Bureau of Standards; and 1 medical director, 1 senior surgeon, 1 dental surgeon, 2 assistant dental surgeons, 1 passed assistant surgeon, and 1 assistant surgeon were serving on detail with the United States Coast Guard Service; 3 surgeons, 1 dental surgeon, 1 passed assistant surgeon, 1 passed

assistant dental surgeon and 3 assistant surgeons were on detail to the Department of Justice for duty at the various penal and correctional institutions.

RESERVE OFFICERS

On July 1, 1930, the reserve commissioned officers on active duty numbered 57, consisting of 1 medical director, 1 senior dental surgeon, 8 surgeons, 15 dental surgeons, 12 passed assistant surgeons, 8 passed assistant dental surgeons, 5 assistant surgeons, and 7 assistant dental surgeons.

On July 1, 1931, the number of reserve officers on active duty was 31, consisting of 5 surgeons, 2 dental surgeons, 11 passed assistant surgeons, 1 passed assistant dental surgeon, 7 assistant surgeons, and 5 assistant dental surgeons.

ACTING ASSISTANT SURGEONS

On July 1, 1930, there were 671 acting assistant surgeons in the Public Health Service, and by July 1, 1931, this number had increased to 717.

Of the 717 acting assistant surgeons, 119 were on duty at marine hospitals; 404 were engaged in immigration, relief, and maritime, border, insular, and foreign quarantine work; 5 were engaged in the prevention of trachoma, 8 were on duty in connection with field investigations of public health and rural sanitation, 109 were on detail with the United States Coast Guard, 5 were serving with the Bureau of Mines by detail, and 51 were engaged in antivenereal-disease activities as part-time employees at nominal compensation. Fifteen of the 51 acting assistant surgeons engaged in antivenereal-disease activities held appointments as collaborating epidemiologists.

ATTENDING SPECIALISTS

On July 1, 1930, there were 316 attending specialists in the service, and during the year this number increased to 370, of which number, 213 were consultants to marine hospitals, while 50 were available for call at second and third class relief stations, and 107 were consultants in connection with quarantine, immigration, and scientific research activities.

INTERNES

On July 1, 1930, there were 84 internes in the service; on July 1, 1931, there were 98, of whom 29 were dental and 2 students. Internes are appointed for temporary periods of one year for duty at marine hospitals.

PHARMACISTS AND ADMINISTRATIVE ASSISTANTS

At the beginning of the fiscal year there were on duty in the service 30 pharmacists and 23 administrative assistants. During the year, by virtue of the act of April 9, 1930, 10 of the chief pharmacists were commissioned as assistant pharmacists in the grade of assistant surgeon; 1 chief pharmacist was retired by the provisions of the civil

service retirement act of May 29, 1930; and an addition of 4 was made in the administrative assistant corps, making a total at the end of the fiscal year of 27.

At the end of the fiscal year the pharmacists and administrative assistants were classed as follows:

Chief pharmacists-----	15
Pharmacists-----	4
Administrative assistants (first class)-----	12
Administrative assistants (second class)-----	4
Administrative assistants (third class)-----	8
Administrative assistants (fourth class)-----	3

NURSES, DIETITIANS, AND RECONSTRUCTION AIDES

The nursing personnel of the Public Health Service increased during the fiscal year from 440 to 488. Including aides, dietitians, social workers, and librarians, the number of personnel under the nursing section is 545.

Since the last report two new hospitals, Detroit and Cleveland, opened on May 2 and July 9, 1930, respectively, have gotten well under way with a decided increase in personnel over the old hospitals. Galveston, New Orleans, and San Francisco will shortly open and will require still more nurses, aides, and dietitians. The additional construction already authorized for hospitals will call for further additions to personnel.

Since the last report, nurses have been assigned to all Federal prisons with the exception of McNeil Island, and three are under orders to report there when requested by the medical officer in charge. The prison work has, from the nursing standpoint, worked out satisfactorily. There has been excellent cooperation from officials in the prisons. At the Federal Industrial Institution for Women, Alderson, W. Va., nurses have been housed in a most unsatisfactory manner. They must live on the station, whereas when assigned to other Federal prisons they live off the station. Quarters suitable for nurses are unavailable at Alderson, and the discomfort in which the nurses must live adds materially to the difficulties of their work.

During the year 293 nurses were certified to the Public Health Service by the Civil Service Commission. Of this number, 126 were selected for appointment, of whom 96 were recruited by the bureau and 30 by the Civil Service.

The unemployment situation among nurses has been reflected in a greater number of applications from nurses to the Civil Service Commission and has resulted in a withdrawal of the authority from the commission to place on duty temporary nurses who meet the educational requirements of the service and who have filed their applications. The commission has directed the Public Health Service to release a number of nurses, seven in all, who were appointed under this authority, some of whom have been on duty a year and all of whom have given satisfactory service. A flexibility in regard to certain situations and to nurses having special qualifications seems at times essential, the lack of which now causes unnecessary difficulty in securing the type of employee with the highly specialized knowledge required in these different types of work.

Nurses in the Public Health Service should be able to transfer from one type of work to another without disturbing the efficiency of

the work. They should be so placed on duty that eventually they would have a knowledge of nursing work required of nurses in all the activities of the service.

Of the nurses on duty, 446 are under the supervision of the Hospital Division; 4 are under the supervision of the Foreign Quarantine Division; 10 are under the supervision of the Domestic Quarantine Division; 1 is under the supervision of the Venereal Disease Division; 24 are under the supervision of the Mental Hygiene Division; 3 are under the supervision of the Scientific Research Division.

During the year, 945 application blanks were sent out in response to requests for information. Of this number, 108 completed applications were received and sent to the Civil Service Commission, and 53 applications were returned as not having the desired qualifications.

There were 155 new appointments, 65 resignations, 2 deaths, and 48 discontinuances.

Contacts with nursing organizations for purposes of recruiting have been made as usual.

Educational activities consist of addresses to interested groups about the work of the Public Health Service, the publication of articles in professional and other magazines and papers, the distribution of printed material about the nursing service, and lectures to student groups and others on nursing subjects.

Conferences with voluntary health organizations are an important part of the work of the nursing section, as is work with the national nursing organizations and the health associations.

Both the superintendent and assistant superintendent of nurses are active in nursing organization work, and it is felt that these contacts are a valuable asset to the service.

The necessity for legislation placing the nursing service of the Public Health Service on the same basis as the nursing services of the Army and Navy is still a matter of paramount importance.

While there have been fewer resignations in the past year, it is felt that this is one of the results of the widespread unemployment of nurses, and that through legislation a still greater degree of stabilization will result.

There are 22 dietitians on duty. In small hospitals the acting chief nurse still acts as dietitian; and when this is the case and the work is satisfactorily performed, the acting chief nurse should have a promotion to chief nurse. It is believed that a dietitian should be placed in every hospital of 100 beds. A chief nurse in a hospital of that size needs all her time for supervision and should not be expected to perform two functions.

A dietitian recently inspected the marine hospital at Key West, Fla., and made some valuable suggestions about the conduct of the department there. She also visited the Federal prison at Atlanta, Ga., and conferred with the chief medical officer and the chief nurse in regard to the hospital diets in the prison hospital.

There are 35 aides on duty in the hospitals and out-patient offices. The difficulty of securing properly qualified male aides is still a matter of importance. The chief aides are training their own assistants, as has been necessary for some time, since the Civil Service Commission is not able to supply the needs.

The coordination of social-service activities in the New York hospitals has been most successful. These are the only Public Health Service hospitals employing social-service workers. Library service is provided by librarians whole or part time, by aides or clerks, and by volunteer workers. Full-time librarians would render valuable service in the larger hospitals of the service.

The emergency-room service for employees at the bureau in Washington has been carried on as usual. During the year, 1,923 persons were treated, distributed as follows:

Public Health Service-----	1,567
Agriculture -----	250
Prohibition -----	20
Bureau of Narcotics-----	5
Bureau of Fisheries-----	9
Census -----	24
Cafeteria -----	3
Outside -----	45

Two nurses were detailed to the Department of Agriculture during the 4-H club encampment from June 17 to 23. This service is given each year.

CONTRACT DENTAL SURGEONS

On July 1, 1930, there were 41 contract dental surgeons employed at marine hospitals and second, third, and fourth class relief stations. These part-time employees are appointed for local duty and 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; 29 were at second, third, and fourth class relief stations; and 4 were detailed to the United States Coast Guard for duty.

EPIDEMIOLOGISTS

The number of 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 increased from 43 to 45, these appointees being on duty in the different States, and the number of assistant collaborating epidemiologists was increased from 4,547 to 4,586. Fifteen of the collaborating epidemiologists also hold appointments as acting assistant surgeons under the Division of Venereal Diseases.

NATIONAL INSTITUTE OF HEALTH

At the close of the fiscal year the personnel of the National Institute of Health included, in addition to the director and assistant director, 3 chiefs of division, 1 senior surgeon, 5 surgeons, 4 passed assistant surgeons, 1 assistant surgeon, 1 pharmacist, 5 special experts, 1 consultant pathologist, 1 consultant dermatologist, 1 consultant cytologist, 1 consultant syphiologist, 1 consultant chemist, 2

senior chemists, 2 chemists, 4 assistant chemists, 1 biochemist, 1 associate biochemist, 1 physiologist, 1 pathologist, 1 cytologist, 1 associate technologist, 3 senior bacteriologists, 1 junior bacteriologist, 1 principal pharmacologist, 1 senior pharmacologist, 1 associate, 1 assistant and 1 junior pharmacologist, 1 senior biophysicist, 1 bacteriological technician, 11 laboratory assistants, 5 laboratory aides, 1 artist, 1 bibliographer, 13 administrative and clerical employees, and 57 laboratory attendants and others.

BOARDS

During the fiscal year 1931, 185 boards were convened for various purposes throughout the service as follows: 8 for the medical examination of detained aliens; 12 for the examination of commissioned officers of the Public Health Service to determine their fitness for promotion; 10 for the examination of applicants for commission in the grade of assistant surgeon in the regular corps; 3 for examination of applicants for commission as assistant dental surgeon in the grade of assistant surgeon, regular corps; 5 for examination of dental internes for commission as assistant dental surgeon in the grade of assistant surgeon, regular corps; 8 for the examination of candidates for entrance into the regular corps as passed assistant surgeon; 9 for the examination of candidates to determine their eligibility for commission as assistant sanitary engineer in the grade of assistant surgeon, regular corps; 1 for the examination of sanitary engineers for entrance into the regular corps; 1 for the examination of pharmacists for commission in the regular corps; 8 for the purpose of inspecting and condemning unserviceable property; 115 for the purpose of making physical examination in connection with the appointment, promotion, and retirement of commissioned officers, warrant officers, ensigns, and cadets in the United States Coast Guard; 1 for the purpose of reexamining persons for color-blindness; 1 for the purpose of making a study and recommending for adoption by the Public Health Service such supplemental clinical record forms as are needed in connection with the medical work in Federal penal and correctional institutions under the control of the Department of Justice; 1 for the purpose of considering certain proposals to modify the present regulations governing quarantine procedure in regard to the epidemic of cerebrospinal meningitis; 1 for the purpose of completing the revision of the Service Regulations as recommended by previous reports on this matter; 1 for the purpose of studying the provisions of the act creating the National Institute of Health.

The advisory board of medical officers, established in 1923 for the purpose of considering compensation claims based on injuries or occupational diseases referred for its action by the chairman of the Employees' Compensation Commission, reviewed and reported upon 21 such cases during the fiscal year.

PROPERTY RECORDS

The property-return section has accounted for all property of the service, and 315 property returns have been audited during the year. Sales of unserviceable property, including boats, livestock, hides, and old metals, aggregated \$5,184.08. Surplus property not desired by

any other Government department was sold for \$272. Surplus property of the Public Health Service valued at \$49,352.42 has been transferred to other Government departments. Surplus property of other Government departments valued at \$18,390.05 has been received by the Public Health Service. Property valued at \$69,903.77 has been transferred from service stations, where it was surplus to other service stations where it could be used. By the exchange value on old typewriters turned in on the purchase price of new machines, \$1,812.50 has been saved and \$726.04 on the exchange value of old motor transportation.

ACCOUNTS SECTION

The accounts section of the Division of Personnel and Accounts conducts all bookkeeping and accounting in connection with the expenditure of service appropriations. This includes also accounts of miscellaneous collections, allotments, records of encumbrances, cost accounting, and the administrative audit. A statement of appropriations, expenditures, and balances, with miscellaneous receipts, is published as an appendix to this report.

PERSONNEL STATEMENT

The accompanying tabular statement shows the personnel of the service as of July 1, 1931. Of the 11,120 employees shown in the table, 4,616 listed as collaborating epidemiologists, and assistant collaborating epidemiologists receive only nominal compensation. They are mainly officers or employees of State and local health organizations who collaborate in the collection of morbidity statistics by furnishing the figures collected by those organizations relating to cases of communicable disease. The personnel statement also includes all part-time employees, those employed on a per-diem basis, and those whose compensation is on a fee basis.

Consolidated personnel report for the quarter ended July 1, 1931

Administrative division and station		Medical and scientific															
		Regular corps						Reserve corps									
		Surgeon general	Medical director	Assistant Surgeon General	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Acting assistant surgeon	Attending specialist and consultant	Contract dental surgeon	Interne	Pharmacist
BUREAU	1		8	1	1	1	1										
FIELD																	
Hospital division:																	
Marine hospitals—																	
Baltimore, Md.			1			3							5	23		8	
Boston, Mass.			1			1							4	10		2	1
Buffalo, N. Y.						1							4	3	1	2	1
Carville, La.						1							3	4			
Chicago, Ill.						2							8	16		6	1
Cleveland, Ohio			1			2							8	3		2	
Detroit, Mich.						1							6	11		1	2
Ellis Island, N. Y.						3							17	5		3	
Evansville, Ind.						1							5	6	1		1
Fort Stanton, N. Mex.						2							1	2			
Galveston, Tex.						1							5	2			
Hudson Street, New York						3							12	16			1
Key West, Fla.						1							3	1	1		
Louisville, Ky.						1							2	2	1	1	1
Memphis, Tenn.						1							7	7	1		
Mobile, Ala.						1							6	6			1
New Orleans, La.						3							3	9		31	1
Norfolk, Va.						3							5	6		10	
Pittsburgh, Pa.						1							3	9		2	
Portland, Me.						1							1	12			
Port Townsend, Wash.						1							3	3			
St. Louis, Mo.													3	15	1		
San Francisco, Calif.													3	17		10	1
Savannah, Ga.													8	8		1	
Seattle, Wash.																	

¹ Not opened yet.

Consolidated personnel report for the quarter ended July 1, 1931—Continued

Administrative division and station	Medical and scientific															
	Regular corps						Reserve corps					Acting assistant surgeon	Attending specialist and consultant	Contract dental surgeon	Interne	Pharmacist
	Surgeon general	Medical director	Assistant Surgeon General	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon					
Hospital division—Continued																
Marine hospitals—Continued																
Stapleton, Staten Island, N. Y.		1			2	5	2			1			3	4	12	2
Vineyard Haven, Mass.						1							1	1	1	
Total hospitals																
Relief stations—																
Second class		1		1	5	4	3						21	42	10	1
Third class													124	8	19	
Total relief stations																
Foreign Quarantine Division:																
Quarantine stations—																
Baltimore, Md.					1								1			
Boston, Mass.					2								3			
Ellis Island (also immigration)		2		1	1	1							19			
El Paso, Tex.													2			
Fort Monroe, Va.		1					1									
Galveston, Tex.													2			
Honolulu, Hawaii		1				1										1
Laredo, Tex.													4			
Marcus Hook, Pa.		1											1			
New Orleans, La.					1		3						3			
Rosebank, N. Y.		1			2	1	1						7	1		3
San Francisco, Calif. (also immigration)					1	1	1						3			
San Juan, P. R.					1								2			
Foreign ports		6		6	10	14	4						70			1
All other stations		2		1	7	6	2						142			
Total quarantine and immigration																

Domestic Quarantine Division:																
Interstate.....					4	3	4							1		
Trachoma.....						1								5	1	
Rural sanitation (regular).....					2	2	1							3	1	
Rural sanitation (drought).....															1	
All other stations.....		1														
Total, all activities.....																
Scientific Research Division:																
National Institute of Health.....		5		1	5	4	1								4	1
Leprosy investigations.....					1	1									2	
Malaria investigations.....				1	3	1										
Nutrition studies.....					1		1								1	
Stream pollution.....					3										6	
Industrial hygiene and sanitation.....				2	1	2									34	
Child hygiene.....													3		7	
Statistical office.....															4	
All other stations.....		1			3	2							1		18	
Total, all activities.....																
Sanitary Reports and Statistics Division.....																
Venereal Diseases Division.....																
Mental Hygiene Division:					1									51	11	
Alderson, W. Va.....														4	2	
Atlanta, Ga.....					1	1	2							1	6	3
Chillicothe, Ohio.....						1				1				1	2	
Fort Leavenworth, Kans.....					2		1				2			1		1
Leavenworth, Kans.....														5	4	2
Petersburg, Va.....														2		
McNeil Island, Wash.....					1				1							
All other stations.....										1					2	
Total, all activities.....																
Miscellaneous:																
Detailed to other offices.....		2		3	7	4	2							5		
Coast Guard.....		1		1		1	1		1	8	3		109		3	
Perry Point, Md. (supply station).....							1									
Public health districts.....		7														
Waiting orders.....		2		14	8	2										
All others.....					1		1							2		1
Total miscellaneous.....																
Grand total.....	1	42	8	33	114	73	78		7	12	12	717	370	41	98	19

Consolidated personnel report for the quarter ended July 1, 1931—Continued

Administrative division and station	General and technical													Total				
	Assistant collaborating epidemiologist and collaborating epidemiologist	Scientific national institute	Administrative assistant	Druggist	Nurse	Aide (P.T. and O.T.)	Dietitian	Laboratorian in röntgenology	Laboratorian in bacteriology	Pilot	Marine engineer	Clerk	All other field employees	Departmental personnel	Medical and scientific	General and technical	Sub	Grand
BUREAU														196	13	196		209
FIELD																		
Hospital Division:																		
Marine hospitals—																		
Baltimore, Md.			1		25	3	2	1	2			8	69		46	111	157	
Boston, Mass.			1	1	19	1		1	1			9	61		23	94	117	
Buffalo, N. Y.					12	1	1		1			4	26		18	45	63	
Carville, La.			1	1	1							6	266		9	275	284	
Chicago, Ill.				1	19	2	2	1	1			8	58		35	92	127	
Cleveland, Ohio			2	1	30				1			11	98		27	142	169	
Detroit, Mich.					16	1	1					6	46		23	70	93	
Ellis Island, N. Y.			2	1	56	3	4	1	1			10	192		29	270	299	
Evansville, Ind.					7							2	16		10	25	35	
Fort Stanton, N. Mex.			1		11	3	1					9	112		10	137	147	
Galveston, Tex. ¹																		
Hudson Street, New York				1	6	5		1	2			11	41		40	67	107	
Key West, Fla.					10							4	25		7	39	46	
Louisville, Ky.					8				1			4	19		16	32	48	
Memphis, Tenn.				1	7			1				3	22		11	34	45	
Mobile, Ala.					12	1		1	1			4	35		13	54	67	
New Orleans, La.				1	40	2	3	2	3			19	117		62	187	249	
Norfolk, Va.					27	1	2	1	1			10	90		29	133	162	
Pittsburgh, Pa.				1	12	1						4	25		17	43	60	
Portland, Me.			1		8	1						3	24		17	37	54	
Port Townsend, Wash.					13							3	29		4	45	49	
St. Louis, Mo.					11		1	1				6	28		20	47	67	
San Francisco, Calif.			1	2	36	4	2	1	1			9	102		48	158	206	
Savannah, Ga.			1	1	17	1	2					5	44		21	71	92	
Seattle, Wash. ¹																		

Stapleton, Staten Island, N. Y.				38	4	4	2	1			13	123		32	185	217
Vineyard Haven, Mass.				3							1	8		4	12	16
Total hospitals														571	2,405	2,976
Relief stations—																
Second class		1	1	4	3		1	1			17	17		88	45	133
Third class		1									9	1		151	11	162
Total relief stations														239	56	295
Foreign Quarantine Division:																
Quarantine stations—																
Baltimore, Md.		1							1	1		17		2	20	22
Boston, Mass.		1		1					2	2	1	19		5	26	31
Ellis Island (also immigration)											1	12		24	13	37
El Paso, Tex.											1	11		2	12	14
Fort Monroe, Va.									2	2	1	16		2	21	23
Galveston, Tex.									3	2		11		3	16	19
Honolulu, Hawaii									1		1	22		2	24	26
Laredo, Tex.												14		4	14	18
Marcus Hook, Pa.		1		2					2	2	1	11		2	19	21
New Orleans, La.									3	1	1	20		7	25	32
Rosebank, N. Y.		3		1					5	6	6	112		16	133	149
San Francisco, Calif. (also immigration)					1				4	2	3	43		6	53	59
San Juan, P. R.									1	1	1	23		3	25	28
Foreign ports											7	47		110	54	164
All other stations		2	1	1					17	18	14	153		161	206	367
Total quarantine and immigration														349	661	1,010
Domestic Quarantine Division:																
Interstate											5	43		12	48	60
Trachoma				10							2	6		7	18	25
Rural sanitation (regular)				22							11	170		9	203	212
Rural sanitation (drought)												920		1	920	921
All other stations											1	25		1	26	27
Total, all activities														30	1,215	1,245
Scientific Research Division:																
National Institute of Health		29									12	78		21	119	140
Leprosy investigations											2	5		4	7	11
Malaria investigations											3	18		5	21	26
Nutrition studies				1								5		3	6	9
Stream pollution											3	16		9	19	28
Industrial hygiene and sanitation											9	13		39	22	61
Child hygiene					1						8	4		10	13	23
Statistical office				1							11	6		4	18	22
All other stations		1									8	45		25	54	79
Total, all activities														120	279	399
Not opened yet.																

Consolidated personnel report for the quarter ended July 1, 1931—Continued

Administrative division and station	General and technical													Total				
	Assistant collaborating epidemiologist and collaborating epidemiologist	Scientific national institute	Administrative assistant	Druggist	Nurse	Aide (P.T. and O.T.)	Dietitian	Laboratorian in röntgenology	Laboratorian in bacteriology	Philot	Marine engineer	Clerk	All other field employees	Departmental personnel	Medical and scientific	General and technical	Sub	Grand
Sanitary Reports and Statistics Division	4,616												2					
Venereal Diseases Division					1							3	9		63	4,618		4,618
Mental Hygiene Division:															13			76
Alderson, W. Va.					6										6	6	12	
Atlanta, Ga.			1	1	5								1		14	8	22	
Chillicothe, Ohio					3								2		5	5	10	
Fort Leavenworth, Kans.			1		3								1		7	5	12	
Leavenworth, Kans.				1	4								1		11	7	18	
Petersburg, Va.			1		1										2	1	3	
McNeill Island, Wash.					2										2	2	4	
All other stations															3		3	
Total, all activities															50	34		84
Miscellaneous:																		
Detailed to other offices															23		23	
Coast Guard															128		128	
Perry Point, Md. (supply station)												4	6		1	10	11	
Public health districts			2									6			7	8	15	
Waiting orders															26		26	
All others															5		5	
Total, miscellaneous															190	18		208
Grand total	4,616	29	27	16	512	39	25	15	18	40	37	324	3,601	196	1,625	9,495		11,120

CHIEF CLERK'S OFFICE

PERSONNEL ON DUTY IN THE BUREAU

On June 30, 1931, the civil-service personnel in the bureau numbered 199, which represented an increase of 6 over the preceding year. The new positions comprised that of an associate naval architect in the Division of Foreign Quarantine, a clerk in the Division of Personnel and Accounts, and four clerical employees in the new Division of Mental Hygiene, established and expanded by the acts of Congress approved January 19, 1929, May 13, 1930, and June 14, 1930.

The personnel maintained its excellent record for punctuality, there being but 1.2 cases of tardiness per employee for the year. The health of the force also presented a favorable showing, with an average of 7.1 days of sick leave. This was an improvement over previous years.

During the year one employee, Miss Katie C. Garth, was retired on account of age. The resignations of two employees were requested on account of unsatisfactory service or conduct.

NEW ADMINISTRATIVE BUILDING FOR THE SERVICE AT WASHINGTON

Congress having granted authority by the act approved July 3, 1930, for the erection of a new administrative building for the service at Washington, steps toward the selection of a site and the preparation of plans were immediately taken. After careful consideration, the Surgeon General recommended a location on Constitution Avenue between Nineteenth and Twentieth Streets. This received the indorsement of the Fine Arts Commission, and on November 17, 1930, the Public Buildings Commission formally approved this site, which is officially known as square 128.

On account of the prominence of the location and its proximity to the Lincoln Memorial, the Arlington Memorial Bridge, and other structures of acknowledged beauty, it was essential that the Public Health Service Building be dignified and conservative in design and possess individual architectural merit. The character of the surroundings also dictated that the structure be of moderate height and that it be set back sufficiently from Constitution Avenue to conform to neighboring buildings and permit of generous landscape treatment.

The design submitted by the special architect engaged for this structure was given careful consideration by the Secretary of the Treasury and the Commission of Fine Arts, and was finally approved after certain modifications in the details of architectural treatment.

The building is to be three stories in height, with a well-lighted basement. The exterior walls will be of white marble. The structure will have a frontage of 260 feet on Constitution Avenue, and the portion now contracted for will provide 44,170 square feet of net office space, exclusive of the basement.

In the working out of the detailed plans, every effort has been made to provide a building that will promote to the utmost the comfort, convenience, and efficiency of the administrative force as far as available funds permit. The natural and artificial lighting and ventilation were given special attention, and it was hoped that it might be possible to install a cooling and air-conditioning system. It was found impracticable, however, to provide this latter feature within the limits of the appropriation available.

Proposals for clearing the site and construction of the foundations were opened on June 24, 1931, and the contract was awarded on June 30 to the Raymond Concrete Pile Co., of New York City. Excavation work began on July 21. Bids for the superstructure were opened on August 3, 1931, and all proposals were found to exceed the amount available. However, by eliminating the terrace feature the cost was reduced sufficiently to permit the award of the contract to the lowest bidder, Wills, Taylor & Mafero Corporation, of New York City.

PRINTING AND BINDING

In spite of the utmost efforts for economy, the fund of \$93,000 available for printing and binding again proved insufficient for the actual needs of the service. For a number of years this condition has existed and is now made more acute by the steady growth of the work of the service, causing increased demands for blank forms and other printed matter, and also by the appearance of the new Division of Mental Hygiene recently created by act of Congress and enlarged in scope by subsequent statutes. The new division brings into existence a considerable field service, involving expenditures for large numbers of blank forms and records, and the division has also found it necessary to issue several publications in pursuance of its work.

These new burdens have not been accompanied by any increase in the allotment, and in the past fiscal year it was found impossible to issue several publications of great and current value to health work.

PUBLIC HEALTH SERVICE LIBRARY

The library added 325 bound volumes to its collection during the fiscal year, bringing its present total to 12,772 volumes. Of these additions, only 49 volumes were purchased. Approximately 285 pamphlets were received, so that the pamphlet collection now numbers 6,800. An unusual number of new editions of standard medical text books were published during the year, and as the library must have the latest editions of these comparatively expensive works for the use of the boards of examiners of the service, the number of other books purchased was necessarily less than in the preceding year.

Periodicals to the number of 259 were received regularly and circulated to officials interested therein. Of these, 34 were paid subscriptions, the remainder being received gratuitously or by exchange. In addition, 145 monthly or weekly bulletins were received from State, city, or foreign health departments.

Books were borrowed almost daily from the Library of Congress, the Library of the National Institute of Health, and the Army Medical Library; and on occasion from 11 other special libraries in Washington. The variety of the subject matter of the books borrowed is an indication of the extensiveness of the field of work of the service.

The library cooperated with movements to render available its resources to other libraries and research workers in the United States. For example, a list of serial publications received by this library from foreign governments was submitted to Miss Winifred Gregory, of the New York Public Library, the editor of the Union List of Serial Publications Received by Libraries in the United States. This compilation is being built up under the auspices of the American Council of Learned Societies, the American Library Association, and the National Research Council. Also, a list of the periodicals received was submitted to the Research Information Service of the National Research Council to be included in a new edition of a list of scientific periodicals received by various libraries in this country.

SUPPLIES, EQUIPMENT, ETC.

During the year approximately 3,250 requisitions for stationery and blank forms from hospitals and other field stations were received and acted upon. The expenditure for stationery aggregated \$24,900, while that for printed forms and letterheads was approximately \$11,000.

Steel storage files sections to the number of 374 were secured free from surplus stock of the Internal Revenue Bureau, thus obviating the necessity of purchasing new equipment for storage of files.

Installation of modern labor-saving equipment in the duplicating unit at moderate cost materially increased the capacity of the unit without increase in force.

APPENDIX

FINANCIAL STATEMENT

The following is a statement of expenditures from appropriations of the Public Health Service for the fiscal year 1931:

Appropriation	Appropriated	Obligations			Unobligated balance
		Incurred	Liquidated	Outstanding	
Salaries, office of Surgeon General, Pay, etc., commissioned officers and pharmacists, Public Health Service.....	\$333,815.00	\$332,054.65	\$332,054.65	-----	\$1,760.35
Pay of acting assistant surgeons, Public Health Service.....	1,361,028.00	1,354,200.00	1,353,989.55	\$210.45	6,828.00
Pay of other employees, Public Health Service.....	378,300.00	375,446.76	375,163.75	283.01	2,853.24
Freight, transportation, etc.....	1,081,650.00	1,070,579.62	1,070,113.71	465.91	11,070.38
Maintenance, National Institute of Health.....	29,000.00	28,246.04	23,761.84	4,484.20	753.96
Books, Public Health Service.....	43,000.00	42,278.93	40,955.25	1,323.68	721.07
Pay of personnel and maintenance of hospitals, Public Health Service.....	500.00	498.96	487.14	11.82	1.04
Quarantine service.....	¹ 7,044,511.60	7,003,496.50	6,915,784.11	87,712.39	41,015.10
Preventing the spread of epidemic diseases.....	777,000.00	768,152.05	562,646.16	205,505.89	8,847.95
Field investigations of public health.....	400,000.00	258,739.95	252,379.22	6,360.73	141,260.05
Interstate quarantine service.....	391,000.00	378,886.30	369,192.77	9,693.53	12,113.70
Studies of rural sanitation.....	68,520.00	66,155.57	64,044.29	2,111.28	2,364.43
Control of biologic products.....	338,000.00	324,279.21	305,488.14	18,791.07	13,720.79
Expenses, Division of Venereal Diseases, Public Health Service.....	46,620.00	45,736.54	45,112.62	623.92	883.46
Narcotic farms.....	100,000.00	89,020.09	86,939.00	2,081.09	10,979.91
Educational exhibits, Public Health Service.....	40,790.00	31,915.55	31,513.39	402.16	8,874.45
Studies of rural sanitation, drought-stricken areas, Public Health Service.....	2,500.00	2,491.67	2,040.93	450.74	8.33
Total.....	²2,000,000.00	388,627.31	373,266.26	15,361.05	³1,611,372.69
Total.....	14,436,234.60	12,560,805.70	12,204,932.78	355,872.92	1,875,428.90

¹ Includes \$1,167,015.60 reimbursement for care of Veterans' Administration patients.

² Appropriated for fiscal years 1931 and 1932.

³ Balance available for obligation in fiscal year 1932.

Quarantine service—Expenditures by stations

Name of station	Pay of officers and employ-ees	Maintenance	Total
CONTINENTAL QUARANTINE STATIONS			
Aransas Pass, Tex.....	\$195.00		\$195.00
Baltimore, Md.....	36,729.42	\$32,997.93	69,727.35
Beaufort, S. C.....	900.00		900.00
Biscayne Bay (Miami), Fla.....	13,424.30	2,378.69	15,802.99
Boca Grande, Fla.....	2,170.00	85.00	2,255.00
Boston (Gallops Island), Mass.....	45,125.16	39,107.95	84,233.11
Brownsville, Tex.....	17,298.04	2,980.71	20,278.75
Brunswick, Ga.....	4,260.00	1,876.33	6,136.33
Cape Fear (Southport), N. C.....	10,710.45	2,969.95	13,680.40
Charleston, S. C.....	20,474.67	7,793.58	28,268.25
Columbia River (Astoria), Oreg.....	7,260.00	5,782.48	13,042.48
Corpus Christi, Tex.....	2,100.00	64.70	2,164.70
Cumberland Sound (Fernandina), Fla.....	2,209.95		2,209.95
Delaware Bay and River (Philadelphia), Pa.....	12,980.00	15,648.31	28,628.31
Delaware Breakwater (Lewes), Del.....	1,805.00	56.95	1,861.95
Del Rio, Tex.....	5,880.00	1,071.42	6,951.42
Eagle Pass, Tex.....	16,419.14	1,400.83	17,819.97
El Paso, Tex.....	27,519.60	3,793.58	31,313.18
Eureka, Calif.....		3.00	3.00
Freeport, Tex.....	470.00		470.00
Galveston, Tex.....	30,030.37	11,136.53	41,166.90
Georgetown, S. C.....	60.00		60.00
Gulfport, Miss.....	6,744.32	892.07	7,636.39
Hidalgo, Tex.....	7,526.08	1,088.10	8,614.18
Key West, Fla.....	5,394.31	543.27	5,937.58
Laredo, Tex.....	27,990.40	3,381.55	31,371.95
Marcus Hook, Pa.....	36,188.51	84,553.09	120,741.60
Mercedes, Tex.....	3,144.00	753.28	3,897.28
Mobile, Ala.....	26,814.63	15,874.79	42,689.42
New Bedford, Mass.....	600.00	20.00	620.00
New Orleans, La.....	66,399.67	8,748.99	75,148.66
Newport, R. I.....		45.00	45.00
New York, N. Y.....	239,459.12	261,686.37	501,145.49
Nogales, Ariz.....	6,685.59	1,766.15	8,451.74
Norfolk (Fort Monroe), Va.....	41,655.52	17,650.82	59,306.34
Pascagoula, Miss.....	1,200.00		1,200.00
Pensacola, Fla.....	16,720.70	2,610.76	19,331.46
Perth Amboy, N. J.....	1,715.29	1,203.12	2,918.41
Plymouth, Mass.....	360.00		360.00
Port Arthur, Tex.....	9,359.66	164.80	9,524.46
Portland, Me.....	15,916.91	4,443.73	20,360.64
Portland, Oreg.....	8,558.00	2,241.60	10,799.60
Port Townsend, Wash.....	15,095.59	3,231.48	18,327.07
Presidio, Tex.....	5,919.40	1,091.42	7,010.82
Providence, R. I.....	1,859.66	785.00	2,644.66
Reedy Island (Port Penn), Del.....	10,209.04	12,255.19	22,464.23
Rio Grande, Tex.....	4,440.00	126.69	4,566.69
Roma, Tex.....	4,733.00	727.87	5,460.87
Sabine, Tex.....	15,859.12	2,502.70	18,361.82
St. Andrews (Panama City), Fla.....	1,200.00	68.00	1,268.00
St. Johns River (Jacksonville), Fla.....	8,858.94	1,972.96	10,831.90
St. Georges Sound (Carabelle), Fla.....	300.00		300.00
San Diego (Point Loma), Calif.....	17,849.90	54,787.14	72,637.04
San Francisco (Angel Island), Calif.....	70,894.85	50,919.65	121,814.50
San Pedro (Los Angeles), Calif.....	35,809.16	14,246.76	50,055.92
Savannah, Ga.....	16,073.86	16,369.42	32,443.28
Seattle, Wash.....	12,378.71	6,348.30	18,727.01
Tampa, Fla.....	17,228.54	12,487.08	29,715.62
Ysleta, Tex.....	1,665.33	22.10	1,687.43
Zapata, Tex.....	2,229.67	549.30	2,778.97
Freight and miscellaneous expenses.....		23,714.80	23,714.80
Travel of medical directors within districts.....		742.19	742.19
Total, continental quarantine stations.....	1,022,458.58	739,763.48	1,762,222.06
INSULAR QUARANTINE STATIONS			
Hawaii.....	40,461.67	14,944.59	55,406.26
Porto Rico.....	39,791.24	9,951.70	49,742.94
Virgin Islands.....	13,958.96	1,507.22	15,466.18
Total, insular quarantine stations.....	94,211.87	26,403.51	120,615.38
Leprosy investigation station, Honolulu, Hawaii.....	21,050.08	1,985.06	23,035.14
Total, all stations.....	1,137,720.53	768,152.05	1,905,872.58

MISCELLANEOUS RECEIPTS

(Covered into the Treasury)

The revenues derived from operations of the Public Health Service during the fiscal year 1931 are as follows:

Source	Amount
Quarantine charges	\$444,646.88
Hospitalization charges and expenses (other than Veterans' Administration patients, and immigration patients at Ellis Island)	34,408.28
Sale of rations	14,414.54
Sale of obsolete or unserviceable equipment	3,407.99
Sale of products, by-products, etc.	3,401.45
Sale of miscellaneous services	299.44
Rents	180.00
Commissions on pay telephones	1,210.91
Reimbursement by Chilean Government for services rendered	12,502.75
Other revenues	67.58
Total	514,539.82

FUNDS TRANSFERRED FROM OTHER DEPARTMENTS

Amounts transferred to the Public Health Service by other departments and establishments and the expenditures therefrom during the fiscal year 1931 are as follows:

Appropriation	Transferred to Public Health Service	Obligated
Veterans' Administration:		
Medical and hospital services, Veterans' Bureau	\$1,180,036.60	\$1,180,036.60
District of Columbia:		
Mosquito control	6,000.00	5,485.37
Department of Justice:		
Federal Industrial Institute for Women, maintenance	33,000.00	25,731.21
Medical and hospital services, penal institutions	65,000.00	57,038.07
Prison camps	3,346.00	2,586.79
United States industrial reformatory, Chillicothe, Ohio	4,500.00	4,251.39
United States penitentiary, Atlanta, Ga.	42,713.00	39,762.73
United States penitentiary, Leavenworth, Kans.	46,300.00	42,781.93
United States penitentiary, Leavenworth, Kans., machinery and equipment	28,700.00	27,169.76
Department of State:		
Waterways treaty, United States and Great Britain	743.47	743.47
Total	1,410,339.07	1,385,587.32

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