ANNUAL REPORT

OF THE

SURGEON GENERAL *of the* PUBLIC HEALTH SERVICE *of the* UNITED STATES

FOR THE FISCAL YEAR

1932

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - - - - - - Price $1.00 (cloth)

TREASURY DEPARTMENT

Document No. 3053

Public Health Service

LETTER OF TRANSMITTAL

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, December 5, 1932.

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 1932.

Respectfully,

OGDEN L. MILLS,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

CONTENTS

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, D. C., October 15, 1932.

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, 1932. This is the sixty-first annual report of this service, covering the one hundred and thirty-fourth year of its existence.

Among the duties imposed upon the Public Health Service by law is 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 functions of the Federal Government. It has long been recognized that the spread of epidemic diseases is related to commercial intercourse. In protecting our territory from invasion by diseases from foreign countries, in accordance with the requirements of law, it has been necessary to keep currently advised as to the prevalence of disease throughout the world in so far as practicable. The increasing use of international aerial transportation makes it of special importance that current information relating to the prevalence of disease in foreign countries be available.

WORLD HEALTH CONDITIONS

During the calendar year 1931, cholera was not reported outside of Asia and the adjacent islands. In the Philippine Islands, 936 cases of cholera were reported, as compared with 4,600 cases during 1930. The prevalence of cholera in the Philippine Islands continued to decrease during the first six months of 1932.

The total number of cases of plague recorded in 1931 in those parts of the world in which vital statistics are compiled was 56,000, as compared with 45,000 cases in 1930. All of the grand subdivisions of the world except Australia reported plague in 1931. In North America no case of human plague was reported, but plague-infected ground squirrels were found in California. In South America plague was reported from Argentina, Chile, Peru, and Ecuador. In Europe a few cases of plague were reported in Spain, and there were scattered cases in other countries. Asia is the great reservoir of plague as well as of cholera. During the calendar year 1931, plague was reported from many Asiatic ports, and this disease caused more than 28,000 deaths in India. In Africa plague was present during the year 1931 along the Mediterranean Sea in the north; in the Union of South Africa in the south; in the Canary Islands, Senegal, Nigeria, and the Belgian Congo in the east; and in Uganda, Kenya, Tanganyika, and the island of Madagascar in the west.

The number of recorded cases of yellow fever is now small, but this disease exists in endemic form in extensive regions in Africa and South America. It is still a menace which must be carefully watched, as its appearance in a nonimmune population might be disastrous. Yellow fever was reported during the calendar year 1931 in several States of Brazil and in Colombia. In Africa, yellow fever was reported in Senegal, the Ivory Coast, the Gold Coast, French Togoland, Nigeria, Upper Volta, Niger Territories, and British Cameroons. During the first six months of 1932 there was an outbreak of yellow fever in southern Bolivia, and competent observers find indications that yellow fever has been endemic in this region for many years.

The incidence of smallpox showed a remarkable decrease during the calendar year 1931 as compared with 1930 and preceding years. International health agencies recorded a total of 160,000 cases of smallpox for 1931 and 315,000 cases for 1930. The total number of recorded deaths from smallpox decreased from 65,000 in 1930 to 33,000 in 1931. The decline in the incidence of smallpox was general, only a few countries reporting increased prevalence in 1931. The general trend of smallpox prevalence has been downward since 1920, with some temporary reactions and with a noteworthy exception in England and Wales, where smallpox increased from 1920 to 1927. In Great Britain the disease has been of mild form and there has been some opposition to vaccination.

Little change was noted in the world prevalence of typhus fever in 1931 as compared with 1930. Just after the World War, in 1919 and 1920, several million cases of typhus fever were reported annually, most of the cases being in eastern Europe. From that time to the present the reported incidence of typhus fever has steadily decreased. In 1930 about 26,000 cases were reported, more than half of these being in the Union of Socialist Soviet Republics. These reports cover the older form of typhus fever, usually spread by lice. Comparatively few cases of this form of typhus fever have appeared in the United States in recent years.

HEALTH CONDITIONS IN THE UNITED STATES

The general health of the people of the United States as reflected by mortality rates has been maintained at a very high level during the last two and one-half years of unfavorable economic conditions. Data on any present effects or incipient untoward conditions caused by the depression have not been collected for the country as a whole. With no unemployment benefits or other contact by which the families of the unemployed can be followed for a period of time for close medical observation, it is doubtful that extensive worth-while data could be assembled without unwarranted expense. It is quite probable that the present remarkably good health conditions are, to some extent, the direct result of efforts on the part of health agencies, which have, no doubt, retarded the evil effects of unemployment and economic hardships upon health. The fortunate absence of any serious widespread epidemics has also been a factor.

Reports to the Public Health Service for the calendar year 1931 and the first half of the year 1932 indicate that health conditions in the United States have continued generally good.

A new low record was established for tuberculosis, reports from 45 States giving an aggregate tuberculosis death rate of 66.3 per

100,000 population, as compared with 68.8 per 100,000 population in 1930, which was the lowest rate for tuberculosis deaths recorded by the Public Health Service up to that year.

During the summer and fall of 1931 a serious epidemic of poliomyelitis (infantile paralysis) occurred. It was most severe in the Northeastern States. The peak of the epidemic occurred in September. The States having the highest case rates were as follows: Connecticut, 70 cases per 100,000 population; New York, 48 cases; Massachusetts, 33; Minnesota, 32; Vermont, 31; Rhode Island, 24; Wisconsin, 24; New Jersey, 24; Michigan, 23; New Hampshire, 16; and Maine, 15 cases per 100,000 population. In Ohio, Kansas, California, and some other States the prevalence of poliomyelitis was less in 1931 than it was in 1930, but the aggregate case rate in 1931 for 42 States was 15 cases per 100,000 population, which is the highest poliomyelitis case rate since 1916, when reports from 27 States gave an aggregate rate of 41 cases per 100,000 population.

In 1931 there was a sudden drop in the incidence of smallpox as compared with preceding years. Reports from 46 States give an aggregate rate of 24.4 cases of smallpox per 100,000 population for the calendar year 1931. This is the lowest smallpox case rate recorded by the Public Health Service since 1916. As usual, there is a great difference in the number of cases of smallpox reported by different States. Indiana reported more than 3,000 cases; Kansas, 2,500 cases; Iowa, 2,225; nine States reported between 1,000 and 2,000 cases; while Delaware, the District of Columbia, Maryland, and Rhode Island did not report any cases of smallpox, and eight other States reported less than 50 cases each.

In 1930 there was a slight reaction from the steady decrease in the prevalence of typhoid fever which has been recorded since comparable annual statistics have been compiled. The case rate for 1930 was 22.1 per 100,000 population and the death rate was 5.0 per 100,000. For the calendar year 1931 the typhoid fever case rate was 21.4 per 100,000 and the death rate 4.6. During the first six months of 1932 the incidence of typhoid fever increased, 5,900 cases being reported, as compared with 4,500 cases during the corresponding period of 1931 and 5,600 cases in 1930. Just after the close of the fiscal year (in July and August, 1932) the number of typhoid fever cases reported was considerably greater than the number for the same months of the preceding year.

The pellagra death rate, based on reports from 46 States, was 6.2 per 100,000 in 1929, 5.9 in 1930, and 4.8 in 1931. This disease is expected to increase when the diet is deficient in certain essentials. The fact that there was a decrease in the pellagra death rates for 1930 and 1931 indicates that preventive measures taken by health departments in localities where the disease threatened were successful.

In the year 1930 the lowest diphtheria death rate (4.9 per 100,000) was registered. In 1931 the rate rose to 5.0 per 100,000. However, this rate is the lowest ever recorded by the Public Health Service except that for 1930. In 1900, for the death registration area, the diphtheria death rate was 43.3 per 100,000 population. If the 1900 diphtheria death rate had prevailed in 1931, there would have been in the latter year 47,000 more diphtheria deaths than actually occurred in that year.

The incidence of meningococcus meningitis (epidemic cerebrospinal meningitis) increased in the United States each year from 1924 to 1929. In the latter year 8.6 cases per 100,000 population were reported to the Public Health Service. For the year 1930 the rate dropped to 7.0 cases per 100,000 population, and during the calendar year 1931 this rate was 4.7 per 100,000. During the first six months of 1932 the decrease in the prevalence of meningococcus meningitis continued, only 1,900 cases being reported, as compared with 3,500 cases during the corresponding period of the preceding year.

Tularaemia was reported from 37 States and the District of Columbia during 1931, a total of 675 cases being reported, as compared with 660 in the preceding year. Reports were received from all States.

Undulant fever, with a total of 1,578 cases, was reported from 45 States and the District of Columbia, reports being received from all States. In 1930, there were 1,450 cases.

Rocky Mountain spotted fever, a milder, eastern type of which was identified in 1930 in the eastern part of the United States by Public Health Service workers, was reported during 1931 from 15 States and the District of Columbia. Preliminary reports show 203 cases.

According to preliminary figures, 44 States (out of 47 reporting) and the District of Columbia reported 374 cases of typhus fever in 1931. The mild form of the disease is endemic along the Atlantic seacoast.

Neither cholera nor yellow fever appeared in the United States during the year, but yellow fever is endemic in parts of South America and it appears from time to time in out-of-the-way places. Natives of these places acquire an immunity to yellow fever, but when the infection is introduced into populations which are not immune, the disease is capable of producing epidemics as serious as those which swept through large sections of the United States during the nineteenth century. It has not appeared in epidemic form in the United States since 1905.

No case of plague was reported in continental United States during the calendar year 1931 or the first six months of 1932, but a fatal case of plague occurred in August, 1931, on Maui Island, Territory of Hawaii. Six plague-infected rats were found in the Territory of Hawaii during 1931 and seven during the first six months of 1932. Fourteen plague-infected ground squirrels were found in California during 1931 in the course of plague-eradication work which has been carried on by State and Federal health authorities for many years. In April, May, and June, 1932, four plague-infected rats were found in Los Angeles, Calif.

One item which helped to keep the general death rate low in 1930 and 1931 was the fact that the influenza death rate was low for both years. Reports for 46 States gave an aggregate influenza death rate of 18.7 per 100,000 population in 1930 and 26.1 per 100,000 in 1931. The 1930 death rate was the lowest since 1924.

The birth rate for 1931 was 17.8 per 1,000 population, and there were 61.7 deaths of infants under 1 year of age per 1,000 live births. Both of these rates are the lowest recorded.

Final death rates for 1931 are not available at the time of writing, but preliminary reports and data from several sources indicate that this rate will be low. For 1929 the death rate in the registration area was 11.9 per 1,000 population. For 1930 it was 11.3 per 1,000. For

1931 reports to the Public Health Service from States having an aggregate population of over 63,000,000 give a death rate of approximately 11.0 per 1,000 population.

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. One case of smallpox and one case of typhus fever reached our quarantine stations and were detained. Two cases of cholera occurred aboard a steamer arriving at Manila; the patients, together with all contacts, were detained at the quarantine station.

Plague was reported to exist in the islands of Hawaii and Maui in the fall of the fiscal year, and vessels arriving from ports in the infected areas of these islands were required to undergo quarantine inspection upon arrival at ports in the United States, and were subjected to fumigation when required. These restrictions remained in force until the latter part of the fiscal year, when quarantine officers were authorized to exempt such vessels from mandatory fumigation when careful rat-infestation inspection was negative and appreciable amounts of cargo of a rat-harboring or rat-attractive nature were not loaded at ports serving the infected areas, provided that bills of health issued at such ports showed suitable precautions taken as regards both the vessel and its cargo in such ports.

The epidemic of cholera which began about May 1, 1932, in the vicinity of Shanghai and Canton, began spreading southward and threatened to assume serious proportions. Special precautions were adopted to protect United States territory, particularly the Philippine Islands, against the introduction of this disease from China. The disease was subsequently reported in Japan, probably having been imported from China.

During the year there was a reported increased prevalence of smallpox in the Orient, particularly in Shanghai, Hong Kong, and Amoy, and appropriate quarantine restrictions, including vaccination, were enforced against these ports. The sanitary condition existing in these ports is of particular significance, owing to their close proximity to the Philippine Islands.

At domestic ports during the year 13,256 vessels, 718,596 passengers, and 998,471 seamen were inspected on arrival by quarantine officers; at insular ports 2,619 vessels, 122,617 passengers, and 205,146 seamen were inspected; and at foreign ports 2,173 vessels, 201,563 passengers, and 160,761 seamen were inspected prior to embarking for the United States. In addition, 2,205 airplanes arrived at official air ports of entry in the United States from foreign ports requiring quarantine inspection. These planes carried 24,694 persons; of this number 17,387 were required to undergo medical examination by medical officers of the Public Health Service, prior to entry.

Of the passengers who embarked at European ports, 26,564 were vaccinated and 10,190 were deloused under the surveillance of medical officers of the service. Clothing and baggage of these passengers, amounting to 24,489 pieces, were disinfected.

A total of 2,455 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 retrieved following fumigation,

4,371 were examined for evidence of plague infection; none were found to be infected.

Executive Order No. 5264, issued on January 24, 1930, restricting for the time being the introduction of parrots into the United States, and the regulations promulgated thereunder remained in force during the fiscal year. A slight outbreak of psittacosis occurred in New York City during October and November, 1931, and subsequently a more serious outbreak of this disease occurred in California. Following this outbreak the health authorities of California drafted a resolution providing State-wide prohibition of importation or exportation of birds of the parrot family in that State. This resolution was designed to prevent the further introduction of psittacosis-infected birds from foreign sources and allow time to determine whether the disease was already established in local aviaries. Officers of the Public Health Service cooperated with the State authorities in the enforcement of these regulations, and consideration is being given to the advisability of a further revision of the special Federal regulations to extend the present regulations governing the importation of parrots to include specifically all birds of the parrot family and possibly to impose some additional restrictive requirements, or else place a complete embargo against the importation of all birds of the parrot family. In the meantime research studies are being continued in an endeavor to obtain additional information respecting the causative organism of this disease and a means for the prevention of its introduction and spread.

The problem of the satisfactory control of psittacosis is receiving international attention, resulting in a commission being appointed by the permanent committee of the International Office of Public Hygiene in Paris to make a study of this problem and make recommendations. While the commission did not come to any definite conclusions, it recommended that temporary prohibition be maintained and that the subject receive further study.

The special studies of the fumigation of ships as a plague-preventive measure conducted at the New York quarantine station continued during the past year with marked progress. A résumé of these investigations was prepared for the information and guidance of the members of the special commission appointed by the health committee of the League of Nations, who visited the United States in the fall of 1931 to study the 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. Experience has shown that fumigation of a loaded vessel destroys approximately 80 per cent or more of the rats on board, and it is now not an unusual procedure to fumigate a cargo-laden vessel when indicated following rat-infestation inspection.

The problem of the sanitary control of aerial navigation also has been receiving international attention for several years, finally culminating in a proposed International Convention for the Sanitary Control of Aerial Navigation, which was prepared and its adoption recommended by the permanent committee of the International Office of Public Hygiene in Paris in May, 1930. This proposed draft was presented during the year for the informal consideration and recommendation of various interested governments. The comments and recommendations submitted by responding governments received the

further consideration of the permanent committee at its meeting in Paris in April, 1932, resulting in some modification of the draft and its approval as modified. It is anticipated that the revised draft convention will soon be formally presented to the various interested governments for ratification.

MEDICAL EXAMINATION OF ALIENS

At domestic ports, 373,034 alien passengers and 897,788 alien seamen were examined by medical officers under the immigration laws. Of this number, 15,115 passengers and 1,367 seamen were certified for various diseases and disabilities. The most important causes and the numbers of alien passengers certified therefor were as follows: Trachoma, 346; tuberculosis, 119; feeble-mindedness, 96; insanity, 85; syphilis, 273; gonorrhea, 394. Of the alien seamen examined, 39 were certified for trachoma; 7 for tuberculosis; 146 for syphilis; 162 for chancroid; and 332 for gonorrhea.

During the year, Public Health Service procedure at United States ports with respect to the certification by medical officers of the detectability of conditions making aliens inadmissible into the United States by competent medical examination performed at time of embarkation or employment on board, was modified. This modification was the result of a joint conference between representatives of the Bureau of Immigration and the Public Health Service to bring the practice into accord with recent court decisions interpreting the immigration laws, and it is anticipated that the new procedure will serve greatly to reduce potential litigation based upon such cases.

As a result of an amendment to the immigration rules and regulations of the Department of Labor, following a conference between the Department of Labor and the Public Health Service, paragraphs 2 and 3 of the Regulations Governing the Medical Examination of Aliens, revised August, 1930, were amended. The amendment of these paragraphs represents no change in policy but merely a technical change in phraseology, regarded to be necessary in order to be correlated properly with the new language resulting from the amendment to the immigration rules and regulations of the Department of Labor. Similarly, in response to a request made by the Secretary of State, paragraphs 97 and 98 of these regulations were amended, again representing no change in policy but only a change in technical phraseology in order that these regulations may conform to the consular regulations relating to the same subject, and to certain provisions of an interdepartmental agreement between the State, Labor, and Treasury Departments.

During the fiscal year ended June 30, 1931, a total of 42,831 applicants for immigration visas were given medical examination in the country of origin. Of this number, 26,560 were examined by medical officers of the Public Health Service attached to American consulates in Europe; the remainder, or 16,271, were examined by medical officers of the Public Health Service attached to American consulates in the Western Hemisphere. Of the number examined in Europe, 7,129 were found to have mental or physical defects; and 3,454 of these were refused visas for medical reasons. Of the number examined in the Western Hemisphere, 1,950 were found to have mental or physical defects, and 1,002 of these were refused visas for medical reasons. Of

38,375 aliens who had been given a preliminary medical examination abroad and to whom visas had been issued, only 7 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

The slight changes in procedure in carrying out the certification of drinking water supplies used by common carriers made during 1931 tended further to increase the efficiency of this work. During the year, 92.75 per cent of the 2,360 supplies used by rail and bus lines, 95.87 per cent of the 242 supplies used on vessels engaged in interstate traffic, and 85.83 per cent of the 120 supplies used on airplane carriers were inspected and reported upon. This is a material increase over previous years. Some gain was made in the number of inspections of vessels engaged in interstate traffic, with a considerable increase in the number of vessels meeting the requirements of the regulations. Of the 1,924 vessels in active service, 1,096 were inspected, of which number 1,069 were given favorable certification.

During the year the report of the Joint Committee on Railway Sanitation of the American Railway Association was completed and made available to all members of that association as well as to the health authorities of the various States. With the recommendations of this committee available more uniform measures of railway sanitation as applied to watering points, coach yards, and terminals will be possible.

Cooperation with and assistance to other Government bureaus and agencies in connection with public health engineering problems again increased. This work has become an important part of the activities of the sanitary engineering personnel of the service. During the fiscal year over 34 per cent of the time of the field force of sanitary engineers, equivalent to 5.4 engineer years, was devoted to assisting other Federal agencies with problems in environmental sanitation.

Regular cooperative rural sanitation studies and demonstrations were conducted in 144 projects in 28 States. The annual survey made by the Public Health Service showed that on January 1, 1932, there were 616 counties in the United States operating permanent local health service under the direction of a full-time medical health officer, an increase of 59 over the number recorded for the preceding year.

The emergency fund for studies of and demonstrations in rural sanitation during the period February 6, 1931, to June 30, 1932, proved a valuable aid to progress in health work in this country, not only in the immediate protection of the health of the people in the drought-stricken areas, but also in the lasting effects of the demonstration that local rural health organizations are of vital importance in maintaining a high standard of health in a community.

A special feature of the regular cooperative work in rural sanitation included the inauguration of advisory service to State health departments on methods of local administration in the fields of child and maternal health and environmental sanitation. Many of the States took advantage of the availability of this service, with the result that improvements were made in the organization of State supervision over the work, with a corresponding improvement in content and character of the activities of the local units.

As a result of the gradual reduction in the prevalence of trachoma in the regions where the activities of the Public Health Service have been carried on in cooperation with the States, it was possible to curtail to some extent the expenditure of Federal funds for trachoma work. This work undoubtedly has prevented thousands of cases of blindness which would have become a burden to the public; and while progress in eradicating the disease has not been rapid, owing to the chronic nature of the malady and the difficulty in reaching many families in which it exists, there is ample evidence that the joint efforts of the service and the State health authorities are slowly but consistently clearing up the local foci in which trachoma has been widely prevalent for many years.

The State of California again remained free of human plague, but the disease appeared in rats in Los Angeles. Prompt measures were taken by the local authorities, with the result that there was no spread of rat infection to other areas and no additional rodent case has been demonstrated by extensive trapping operations in the original focus of infection. However, this reoccurrence of rat plague emphasizes the necessity for continuous activity of the Public Health Service toward the control of rodent infection in the areas adjacent to cities on the California coast.

INVESTIGATIONS OF PUBLIC HEALTH PROBLEMS

Studies of cancer have been continued both at the Harvard Medical School and at the National Institute of Health. Those at the Harvard Medical School have been a continuation of the program for research begun in the preceding fiscal year and have included (1) studies of the biological effects of radiation, (2) studies of immunity to malignant growths, (3) biochemical studies, (4) cytological studies, and (5) studies of susceptibility to malignant growths. At the National Institute of Health the work has been based on the assumption that cancer is a chemical abnormality of living cells. The various phases of the investigation have included (1) the hydrogen-ion concentration of normal and malignant tissues in the living animal, (2) influence of the oxygen tension on the proteolysis of tumors and normal tissues, (3) tissue cultures, (4) chemistry of cell division, and (5) chemotherapy.

Studies of heart disease were begun early in the fiscal year, with the selection of the experimental features of rheumatic heart disease for the initial study.

At the leprosy investigation station in Hawaii, steady progress is being made in an endeavor to improve methods of treatment and diet. An analysis of the food eaten by a group of patients during a 5-day week indicates that the patients choose a diet which is suboptimum in protein and fat, and definitely low in fruits and vegetables.

The 10-day dusting study, using Paris green, over a county-wide area has been completed. It is interesting to note that in spite of heavy mosquito production the malaria rate in this area has fallen about 90 per cent. Studies on the feasibility of supplying malarial infection to hospitals for use in the treatment of paresis have been continued.

Through a study of the airplane convection of mosquitoes it has been established that approximately 20 per cent of all planes arriving from tropical countries brought one or another species of mosquito

with them. There is thus not only danger of the introduction of yellow fever by means of infected mosquitoes, but greater danger is apprehended in the introduction of new species of insects not indigenous to the United States.

Pellagra studies were concerned largely with the determination of the probable pellagra-preventive value of individual foodstuffs. In addition, chemical studies were made on methods for the quantitative estimation of the antipellagra vitamin.

At the request of the Governor of Hawaii and with the approval of the Secretary of the Interior, work was undertaken in connection with the control and eradication of bubonic plague in the Hawaiian Islands following the report of a human case.

The demand for the Rocky Mountain spotted-fever vaccine manufactured at the spotted-fever laboratory at Hamilton, Mont., continues to increase, and was 75 per cent greater than in 1931, the entire supply available being exhausted soon after the middle of the 1932 tick season.

Studies of tick parasites as a possible agency for the control of *Dermacentor andersoni* in the Rocky Mountain region were begun by the State of Montana in 1926. In connection with the purchase of the Hamilton Laboratory from the State of Montana, the Public Health Service took over the conduct of these studies at the beginning of the fiscal year.

Epidemiological investigations of Rocky Mountain spotted fever, eastern type, have revealed a somewhat wider geographic distribution of the eastern type than known a year ago. The disease has now been found in Pennsylvania, New Jersey, Delaware, Maryland, the District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Louisiana, Minnesota, and possibly in Tennessee. Criteria were established for the diagnosis of spotted fever in laboratory animals.

Child hygiene investigations have included (1) a study of children of psychotic parents, (2) a study of the mental status of children of various types of birth, (3) a study of dental caries in relation to diet and climate, and (4) a study of the hearing of school children. This latter study, which was begun early in the fiscal year, is of importance, because there seems to be a rather high incidence of defective hearing in childhood. The handicap of deafness may seriously interfere with material and intellectual advancement and early discovery of the defect offers the best chance for improvement, adjustment, or training.

Dental studies were undertaken at the beginning of the fiscal year, with the assignment of a dental officer whose initial problem is the distribution of mottled enamel in the United States.

Studies of the health of workers in the following additional dusty trades have been conducted: Marble stone finishing, slate quarrying and milling, talc mining and milling, and granite stone quarrying.

A study of air pollution is being made in the cities of Washington, Baltimore, Philadelphia, New York, Boston, Buffalo, Cleveland, Detroit, Chicago, Pittsburgh, St. Louis, San Francisco, Los Angeles, and New Orleans, in order to obtain data on the condition of the air in the average American city.

A study of the loss of light due to smoke in Baltimore, Md., covering a period of 12 months, showed a large relative loss of light due to smoke.

The investigation of industrial skin diseases has so far covered the following industries: Rubber, dyeing of silk, wool and fur, oil refineries, and candy making.

The office of milk investigations has been engaged in the following investigations: (1) Studies of the bactericidal treatment of containers and equipment in connection with milk production, processing, and distribution; (2) studies of the public health significance of milk cooling; (3) studies of the value of chlorine disinfection of udders and hands as compared with simple cleansing; (4) studies of the relative value of the direct microscopic count, the standard plate count, and the methylene blue reductase test as measures of milk sanitation; (5) studies of the effect of heating upon the growth-promoting characteristics of cow's milk; and (6) studies of the extent of pasteurization and tuberculin testing in American cities of 10,000 population and over in 1927 and 1931.

A detailed analysis of the program of the health agencies in Brunswick and Greenville Counties, Va., is being conducted by the office of public health methods. The initial phase of the study is designed so as to determine the health needs of people living in rural areas and the manner in which an average small county health department is meeting these problems.

The office of statistical investigations has been tabulating data on the incidence and cost of illness in about 9,000 families located in 17 States and the District of Columbia. An incidence of 850 illnesses per 1,000 population per year was recorded. Of the cases serious enough to cause the patient to go to bed for one or more days, the incidence rate was 461 per 1,000 persons per year, or 52 per cent, and of those that caused the patient to lose time from his usual work or school there were 545 per 1,000 persons per year, or 61 per cent.

At the stream pollution laboratory at Cincinnati, Ohio, particular attention is being paid to the rounding out of experimental evidence and the summation, in permanent form, of the more important conclusions developed from the research studies in water purification and natural stream purification upon which it has been engaged in recent years. It has appeared advisable to give increased consideration to the subject of sewage treatment, and in furtherance of this plan an experimental activated sludge treatment plant is being constructed for the research study of certain of the biochemical and biological factors operative in this method of sewage purification.

Following the discovery, in 1931, that rat fleas, taken on premises where cases of endemic typhus were occurring, contained the virus of the disease, studies were carried out to determine the behavior of the virus in the flea and the exact mechanism of transmission from rat to rat. It was found that the virus could survive in *Xenopsylla cheopis* as long as 52 days, this being the limit of the experiment. It is thought possible that fleas once infected may remain infected through life.

The virus was found to undergo multiplication in the flea. After the lapse of some days, titrations showed that the virus present in $\frac{1}{128000}$ of an infected flea was sufficient to infect a guinea pig.

Endemic typhus is readily transmissible from rat to rat by means of fleas when the fleas are allowed free access to the rat. Efforts to transmit typhus by feeding infected fleas on rats and guinea pigs

through chiffon were without result. The feces of infected fleas were found to contain the virus; when this material was rubbed into the abraded skin of guinea pigs, the disease was transmitted.

A vaccine prepared from an emulsion of typhus-infected fleas conferred some immunity upon guinea pigs.

Evidence has been obtained that psittacosis is occasionally transmitted from person to person, particularly from patient to nurse. Epidemiological studies appear to show that, in California, the shell parrakeet is the great reservoir of infection. Cases of the disease occurring in New York City were investigated, and the infection was traced to shell parrakeets obtained from a bird dealer in San Francisco. The fact was revealed that psittacosis is present in the parrakeet-breeding aviaries of southern California.

The possible danger to health from cold-storage wild rabbits has been shown by experiments in which rabbits stored for 5 months at 3° C. and those stored for 10 months at minus 15° C. still harbored virulent *Bacterium tularense*.

The National Institute of Health received 120 new strains of meningococci during the year; workers there have now made an intensive study of the cultural characteristics and serological interrelationships of 492 strains of the organism. Experiments with rabbits showed that both a clinical and an histopathological meningitis can be produced by intracisternal injection of large doses of virulent meningococci.

A pharmacological study of phenol esters has disclosed certain relationships between the rate of hydrolysis of these compounds *in vitro*, their stability and hydrolysis *in vivo*, and their pharmacologic action in the animal organism.

A large number of sugar compounds were prepared and studied, with a view to enlarging our knowledge in the field of sugar chemistry, which may throw light upon some of the obscure problems of disease.

The building program of the service includes two additional buildings on the present site of the National Institute of Health, to be used as administration and laboratory buildings respectively, which are now under construction, a laboratory building at Hamilton, Mont., for use in connection with Rocky Mountain spotted fever studies, plans for which were practically completed at the end of the fiscal year, and a laboratory building on the site of the new marine hospital at San Francisco, Calif., where studies of mycotic diseases and plague work will be carried on.

THE MARINE HOSPITALS AND OTHER RELIEF STATIONS

Hospital and out-patient care were furnished to all legal beneficiaries in 25 marine hospitals, 16 second-class, 102 third-class, and 14 fourth-class stations, and to Coast Guard personnel and lighthouse keepers at 108 other points. Twenty-four medical and dental officers were also assigned to exclusive duty with the Coast Guard at sea and elsewhere. A total of 343,054 persons applied for treatment and other medical services which aggregated 1,734,508 hospital days, 972,110 out-patient treatments, and 76,179 physical examinations. The usual assistance was given to the Civil Service Commission, Steamboat Inspection Service, Bureau of Immigration, Bureau of Industrial Alcohol, Employees' Compensation Commis-

sion, Veterans' Administration, Army Engineer Corps, Coast and Geodetic Survey, Shipping Board, and other Government establishments. Sixty-one patients were admitted at the request of various State health officers, to the National Leper Home, where at the close of the year there were 366 leper patients.

Contracts have been let by the Supervising Architect for the construction of all the principal marine hospital buildings for which appropriations have been made except at Stapleton, Norfolk, and Memphis, where plans have been completed and construction will shortly begin.

PREVENTION AND CONTROL OF VENEREAL DISEASES

The work conducted during the year relating to the venereal diseases has been outstanding, considering the limited funds available for this work. Some of the most important of these activities are as follows: Extensive laboratory research on personal prophylaxis of syphilis, including determination of the relative efficacy of a large number of chemical and pharmaceutical preparations that offer promise of protection; inquiries into the origin and nature of the substance or substances in the blood responsible for the Wassermann reaction; studies in the biology of the *Treponema pallidum;* and experimentation for the development of biologic products for use in the diagnosis and treatment of gonorrhea. Several papers giving the results of research into these problems are now in preparation for publication.

Clinical research has been limited largely to inquiries into the most effective treatment of early syphilis, conducted in cooperation with five of the leading venereal disease clinics of the country. The published results of some of these studies that have been completed during the year indicate the early formulation of improved and greatly simplified methods of treatment of this enormously prevalent and tragically devastating disease.

The venereal disease clinic at Hot Springs, Ark., has been maintained on a high plane of efficiency. The year has witnessed not only a marked increase in the number of applicants for free treatment but also a change in the type of applicant, apparently of a higher social status who are induced to seek free treatment because of the present period of economic stress.

Valuable cooperation has been extended to the marine hospitals, Federal penal and correctional institutions, and the Office of Indian Affairs, Department of the Interior, for improving the quality of antiluetic treatment for service beneficiaries, in Federal penal and correctional institutions, and the organization of effective syphilis control measures among Indians.

Increased attention has also been given to the malaria treatment of general paralysis of the insane. The central malaria depot maintained at Columbia, S. C., continued to function smoothly and to supply the increasing demands for infectious material for therapeutic purposes.

During the year, 2,458,932 laboratory examinations were made in 43 States cooperating with the service in reporting on the prevalence of the venereal diseases and the measures employed for their control, representing an increase of 15 per cent over the preceding year.

In addition, these States reported 422,191 cases of venereal diseases under treatment—260,564 cases of syphilis, 158,083 cases of gonorrhea, and 3,544 cases of chancroid. This represents an increase for all venereal diseases over the preceding year of 8.4 per cent—for syphilis 13.4 per cent, and gonorrhea 1.4 per cent. There was an increase in the number of clinics reporting during the year, and an increase also of 3.4 per cent of new cases admitted to these clinics over the preceding year.

NARCOTIC FARMS AND MEDICAL AND PSYCHIATRIC CARE OF FEDERAL PRISONERS

The fiscal year marks the second full 12 months' activities of the Division of Mental Hygiene, occupied with administrative duties incident to the establishment of United States narcotic farms, and with supervising and furnishing the medical, psychiatric, and technical services for Federal prisons. The investigative functions have involved special studies dealing with the subject of the abusive uses of narcotic drugs; the quantities necessary for the medicinal and scientific needs of the country; and of the nature of narcotic drug addiction.

The collection of data dealing with the medico-social aspects of drug addiction was continued, and brief abstracts of laws and regulations of the several States and local jurisdictions, dealing with the narcotic drug situation, were prepared during the course of the year. Further analysis has been made of the legal distribution of narcotic drugs throughout the United States in connection with the studies of the abusive uses of such drugs, and of the quantities necessary for supplying the medicinal and scientific needs of the country.

Construction of the first United States narcotic farm, in the vicinity of Lexington, Ky., was begun in January, 1932.

The Public Health Service has continued to supervise the medical services at the several penal and correctional institutions operated by the Department of Justice. The service assumed the medical services at three additional institutions during the past year: The Federal correctional camp, Fort Eustis, Va., on January 1; and at the Federal jail, New Orleans, La., and the Federal detention farm, La Tuna, Tex., on March 1, 1932. Requests were received for the service to supervise and furnish the medical service at the Federal detention headquarters, New York City, N. Y., and the Hospital for Defective Delinquents, Springfield, Mo.

Special studies have been made with reference to an appropriate dietary for hospital prisons, the administrative problems involved in connection with the care of the ambulant sick prisoner, standards for the physical and mental examinations of prisoners, and the psychiatric phases associated with the disciplinary and other problems of penal and correctional procedure.

COOPERATION WITH OTHER AGENCIES

During the fiscal year the Public Health Service continued its cooperative activities with official and unofficial organizations in matters concerning the public health. A number of these cooperative activities are required by law and the remainder are deemed

necessary in the interest of economical and efficient administration. By means of this cooperation similar or related activities are coordinated and duplication of effort is avoided. Among the more important cooperative activities of the service, the following may be mentioned:

1. With the Department of State in detailing medical officers for duty at consulates in Europe, Canada, Mexico, and Cuba to examine medically intending immigrants for visa purposes, and in the issuance of bills of health by American consuls and related quarantine work; in the treatment of sick, destitute seamen returned from abroad; in advising with the Department of State in problems arising incident to certain international problems of the narcotic drug situation; notification of the occurrence of plague or cholera in the United States or its possessions.

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; 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 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 first narcotic farm near Lexington, Ky.; with the Office of the Supervising Architect with regard to air conditioning apparatus and in the preparation of plans for water supply and sewage disposal systems at border stations; with the Bureau of Customs in adjudication of violations of the act of February 15, 1893, resulting from failure of masters of vessels to present American consular bills of health; in issuing port sanitary statements to outbound vessels; and in standardizing and administering procedures required of aircraft arriving in the United States from foreign countries; with Bureau of Narcotics in advising relative to administrative problems.

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); in making examinations of the drinking water systems on vessels of the United States Army engineers; with the United States naval hospital, League Island, Pa., on the therapy of paresis.

4. With the Department of Justice and local United States district attorneys in matters related to the protection of the interests of the United States in which the administration of the quarantine laws and regulations is concerned, or in which the proper care and preservation of public property are concerned; with the Bureau of Prisons in furnishing the medical and psychiatric services in Federal penal and correctional institutions; in treating Federal prisoners in and from jails and prisons lacking proper medical facilities; 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.

5. With the Post Office Department in supplying first aid and special physical examinations; inoculation of employees handling mails against typhoid fever 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 in relation to diet and climate; in the investigation of water supply and sewerage systems on Indian jurisdictions; in the development and organization of the mass control of syphilis among reservation Indians; with the National Park Service in the supervision of sanitation in the national parks and mountains; in maintaining a venereal disease clinic for indigents at Hot Springs; in the examination of water supplies and advice regarding sanitation in connection with the Hoover Dam.

7. With the Department of Agriculture in inoculating certain field employees against typhoid fever and vaccinating against smallpox; assisting in the local enforcement of plant and animal quarantine on vessels arriving from foreign ports; in making sanitary surveys of national forests and watersheds; in the enforcement of the pure food law in relation to the adulteration of shellfish; and in the investigation of the disposal of industrial wastes at the experimental station at Houma, La.

8. With the Department of Commerce in standardizing and administering procedures required af 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; physical examination and instruction and examination in the principles of first aid of applicants for license as ships' officers, at the request of the Steamboat Inspection Service; 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; in making sanitary surveys of lighthouse and airway stations; in the examination of drinking water systems on vessels; and in making a sanitary survey of the helium plant at Amarillo, Tex.; with the Bureau of Standards by detail of an officer in charge of the dispensary and for the investigation of health hazards in industry; with the Bureau of Mines by the detail of medical personnel.

9. With the Department of Labor by examining immigrants in the United States and furnishing medical care to detained aliens; also standardizing and administering procedures required of aircraft arriving in the United States from foreign countries; with the Children's Bureau by representation on the advisory committee on the regulation of employment of minors in hazardous industries.

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

11. With the United States Shipping Board by physical examination of crews; in the development of a program for prevention of venereal diseases among the seamen in the American Merchant Marine.

12. With the United States Employees' Compensation Commission in supplying hospital and out-patient treatment of disabled Federal employees; physical examinations and special investigations; a permanent board of medical officers for disputed and difficult claims; medical assistance in carrying out the longshoremen's and harbor worker's 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; physical examinations of applicants for military pensions requested by the Bureau of Pensions.

14. 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.

15. With the Office of Public Buildings and Public Parks of the National Capital in the sanitary inspection of Government office buildings in Washington, and in mosquito control work on Government reservations in the District of Columbia.

16. With the House of Representatives in an investigation of the air conditioning in the House Chamber and several committee rooms and with the Committee on Claims, House of Representatives in physical examinations of subjects of special bills.

17. With the Board of Health of the Territory of Hawaii in the care and treatment of lepers and in the control and eradication of bubonic plague.

18. With the Office International d'Hygiene Publique, Paris, and the Pan American Sanitary Bureau, Washington, D. C., in matters relating to public health and maritime quarantine and the exchange of information relative to the prevalence of quarantinable diseases.

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

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

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

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

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

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

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

26. With 21 States in the conduct of a school of instruction regarding studies of stream pollution.

27. 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.

28. 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.

29. With Alabama, Arizona, Arkansas, California, Florida, Georgia, Idaho, Iowa, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nevada, New Mexico, North Carolina, Ohio, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Virginia, and Washington in making cooperative demonstrations in county health work in counties in these States.

30. With Alabama, Arkansas, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, North Carolina, North Dakota, Ohio, Pennsylvania, South Carolina, Texas, Tennessee, Virginia, and West Virginia in cooperative county health work in the drought-stricken areas.

31. With Montana, Oregon, Wyoming, Idaho, Washington, Nevada, California, Colorado, Utah, New Mexico, South Dakota, Nebraska, Minnesota, and Pennsylvania in furnishing vaccine for protection against Rocky Mountain spotted fever.

32. With Illinois, Arkansas, West Virginia, Kentucky and Oregon in venereal disease prevalence surveys.

33. With New York, New Jersey, and Connecticut in the formulation of a Tri-State Treaty Commission for the regulation of pollution of the harbor in the vicinity of New York City.

34. With Louisiana, Tennessee, and Kentucky in pellagra control measures.

35. With Pennsylvania, West Virginia, and Ohio in connection with a survey of the sanitary condition of the Upper Ohio River.

36. With Massachusetts and Virginia in making surveys and furnishing advice concerning mosquito-control measures.

37. With Tennessee and Georgia in county-wide malaria control experiments.

38. With Missouri for advice concerning a study of the Missouri River.

39. With the District of Columbia, in an investigation of the hearing of school children and in mosquito-control work.

40. With Idaho in a study of the problem of the pollution of the Coeur d'Alene River.

41. With Texas in a mosquito survey of Galveston and its environs.

42. With Georgia in the reorganization of the Richmond County Board of Health.

43. With Virginia in a survey of salt marsh mosquito production areas in southeastern Virginia.

44. With California in the investigation of an outbreak of psittacosis.

45. With Maryland in a survey of the milk supply of Anne Arundel County.

46. With Minnesota in the reorganization of the Duluth health department.

47. With Kansas in a survey of the work and organization of the State board of health.

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

49. With the cities of Wilkes Barre, Pa., Baltimore, Md., and Seattle, Wash., in surveys of health service.

50. With the cities of Baltimore, Md.; Birmingham, Ala.; Dallas, Tex.; San Francisco, Calif.; Charleston, W. Va.; and New Orleans, La., in venereal disease prevalence surveys.

51. 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.

52. With the Baltimore Health Department and the Baltimore Chamber of Commerce in a study of the loss of light due to smoke in Baltimore, Md.

53. With Rocky Mount, N. C., in a survey of mosquito production.

54. With the Canadian Health Department in the enforcement of Canadian and American regulations concerning water supplies, water supply systems of 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 Julius Rosenwald Fund in the promotion of syphilis control among rural Negroes in the Southern States; the Milbank Memorial Fund in research of syphilis and in studies of morbidity in a rural and

an urban area; the Gorgas Memorial Laboratory in malaria research; the National Research Council by representation on its committees; with the international health division of the Rockefeller Foundation in cooperative county health work and emergency health work resulting from the drought; with the health division of the Department of Public Welfare of the General Federation of Women's Clubs through membership on the National Advisory Committee; with the National Parent-Teachers Association through membership on the Advisory Council on Child Health; 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; with the Marine Library Association in the distribution of educational material to seamen in the merchant marine; the American Railway Association in the completion of the report with recommendations concerning the sanitation of rail water supplies and coach yards; the American Association of Railroad Surgeons for the better control of the venereal diseases among railway employees; the Brotherhood of Railroad Trainmen in the investigation of an eye condition occurring among railroad employees in Kansas; the International Commission on Zoological Nomenclature in connection with questions on nomenclature and terminology; the National Conference on the Nomenclature of Disease in developing a standard system of nomenclature of disease for the United States; the New York Loose Milk Commission in a determination of the hazard involved in the sale of loose milk in New York City; the President's Conference on Home Building and Home Ownership through membership on its committees; the Committee on the Costs of Medical Care in the tabulation of data on the incidence and cost of illness; Brookings Institution in a study of the public health organization in Mississippi and Alabama as a part of their general survey of the State governments; the American Standards Association in assisting in the formulation of standard specifications for household refrigerators; Johns Hopkins Hospital in the study of the mental status of children of various types of birth; the Girl Scouts of the District of Columbia in physical examination of girl scouts; the Ohio River and Great Lakes Drainage Basin Boards in the formulation of suitable analytical procedures for stream examinations; the Del-Mar-Va Eastern Shore Association in connection with an antimosquito campaign; the Academy of Medicine of Long Beach, Calif., in a survey of the social and medical agencies of Long Beach; the Milledgeville (Ga.) State Hospital in connection with studies of pellagra; the drug committee of the National Research Council, the statistical committee of the American Psychiatric Association, the psychiatric committee of the American Medical Association, and a special committee of the American Hospital Association concerning the best methods of safeguarding the use of narcotic drugs in American hospitals to indispensable purposes; the commission of the League of Nations in standardizing methods of opium assay.

Cooperation between the various divisions of the service enables any particular division to take advantage of service facilities, including hospital and laboratory.

The Public Health Service desires to acknowledge assistance received from the following agencies:

The Department of Health of Puerto 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; boards of health of Florida, Indiana, and Washington, and city health departments of Baltimore, Buffalo, Milwaukee, and the University of Kentucky for Wassermann tests performed; the medical schools of Harvard and Yale Universities and the State hospital for the insane, Columbia, S. C., for laboratory space; Jackson Memorial Laboratory at Bar Harbor, Me., for assistance in cancer studies; Crocker Institute for Cancer Research for strains of transplantable tumors; Pan American Airways for cooperation in a study of the airplane convection of mosquitoes. The cooperation rendered by these several agencies has made practicable the conduct of certain important activities.

RECOMMENDATIONS

The promotion of the public health and the prevention of disease are of fundamental importance to the Nation. Recommendations as to

the methods of protecting the public health in the most economical and efficient manner are necessary from time to time.

New problems relating to the prevention and control of disease are constantly arising; as recent examples may be mentioned the identification of Rocky Mountain spotted fever of the eastern type along the Atlantic seaboard of the United States and the recognition of parrot fever, or psittacosis, as an endemic disease among birds of the parrot family in certain sections of the Pacific coast. Constant vigilance is required for the detection and prevention of new dangers to the public health that arise from time to time.

The recommendations submitted herewith constitute the most important needs at the present time.

SCIENTIFIC RESEARCH

In connection with the development and expansion of the research activities of the National Institute of Health, there is an increasing need for an animal farm for the breeding of animals necessary in these investigations. At the present time the limitations of supply and the loss of animals due to intercurrent infections present a serious problem and handicap in the conduct of experiments. If an animal farm could be made available it would be possible to regulate the supply to meet the demand and to insure the propagation of known strains free from infections.

In connection with the present economy program of the Federal Government, it has been necessary to postpone a number of studies which could be profitably pursued and which are of general public health importance. There is practically no field of public health research which does not contain important problems, but in some fields there is a pressing need to extend the work now under investigation. Among such studies are those in connection with the control and standardization of biologic products, the investigation of many chemical products, especially new compounds which have come into general and industrial use without adequate knowledge of their toxicity, and extended inquiry into the field of nutrition as it relates particularly to the vitamins.

RURAL HEALTH WORK

Sanitarians now generally concede that attempts to prevent the spread of highly contagious and infectious diseases 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. Therefore, it is believed that the best way for the Public Health Service to control the interstate spread of diseases, and incidentally to bring about a betterment in the status of the health of the citizens of the United States as a whole, is to render assistance to State and local authorities in the development and extension of adequate local health organizations.

Since the Public Health Service began its cooperative activities in studies and demonstrations in rural sanitation, there has been a constant increase year by year in the number of efficient local health organizations rendering service to the rural populace of the United States. As yet, however, approximately only 30 per cent of the people residing in the rural sections of the United States are enjoying

the health and economic advantages of such service. The continued cooperation on the part of the Federal Government in this activity is deemed essential, and the 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 health service may be extended more rapidly.

MARITIME QUARANTINE

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 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. A proposed International Convention for the Sanitary Control of Aerial Navigation has recently been prepared under the auspices of the International Office of Public Hygiene in Paris and will shortly be referred to participating governments for ratification and adoption. Under this convention the designation of airports of entry would be limited in adhering countries to airports possessing medical personnel and quarantine facilities, as prescribed by the convention.

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.

The International Sanitary Convention of Paris, revised in 1926, ratified by the Senate on March 22, 1928, imposed upon adhering countries the obligation to provide their principal ports with personnel trained in the examination of ships for rat-infestation purposes and the disinfestation of those determined to be rat infested. For over a score of years the United States has maintained a leading position as regards personnel and equipment for the deratization of vessels, but personnel for the examination of vessels for rat-infestation purposes had to be provided. It was requested that 25 new positions be authorized for the fiscal year 1931 to provide personnel trained in the rat-infestation inspection of vessels at the most important United States ports, in compliance with these treaty requirements, of which number 15 were subsequently authorized. It had been possible to procure and train about 10 of these 15 inspectors prior to the prohibition against new positions, made effective during the spring of 1932. As soon as fiscal conditions permit, 15 additional inspectors, 5 of whom have

already been authorized, should be provided in order that the United States may carry out its treaty obligations in regard to the rat-infestation inspection of vessels arriving from foreign ports, in accordance with treaty requirements.

MARINE HOSPITALS

The need for additional hospital buildings at the National Leper Home has become urgent, as the institution is now full and additional facilities are needed, especially for bedfast patients for whose care a suitable building is lacking. To complete the building program, quarters should be constructed at certain marine hospitals as an economical measure to save rentals and allowances, and ward buildings are required in a few places to remove fire hazards and improve facilities. The hospitals chiefly concerned are those at Boston, Buffalo, Fort Stanton, Pittsburgh, Portland (Me.), and St. Louis.

PRINTING

The expanding activities of the Public Health Service imposed by law, particularly with respect to the Division of Mental Hygiene in relation to the development of the narcotic farms and the furnishing of medical and psychiatric care to Federal prisoners, have made imperative for administrative use much additional printing of blank forms and similar matter. Because a considerable amount of the printing allotment has necessarily gone to new activities, a large number of manuscripts of important studies conducted by the service of interest to public health workers, have not been published by reason of the lack of necessary printing funds. The allotment of funds for printing for the fiscal year 1933 has been reduced by almost 50 per cent. This will seriously handicap the work of the Public Health Service. It is recommended that as soon as possible the allotment of funds available for printing be restored to the normal amount.

PERSONNEL

The scope of service activities and the obligations imposed upon it call for additional specialized personnel. The diversity of obligations imposed upon the service makes pressing demands for enlarging the regular medical corps of the Public Health Service so as to permit and provide specialization in certain lines of its essential work. Fourteen additional regular medical and dental officers are needed for assignment to new units of Federal penal and correctional institutions.

Additional commissioned medical officers are needed in the marine hospitals to devote themselves to special professional services that can not, in the present advanced state of medicine, be satisfactorily performed by officers whose hospital duties alternate with other assignments. A number of high-salaried acting assistant surgeons would be thus replaced. Additional commissioned medical officers are also needed for assignment to important investigative studies.

H. S. CUMMING,
Surgeon General.

Hon. OGDEN L. MILLS,
Secretary of the Treasury.

DIVISION OF SCIENTIFIC RESEARCH

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

CANCER

Medical Director J. W. Schereschewsky continued in charge of the field investigations of cancer with headquarters at the Harvard Medical School. The work carried out during the fiscal year consisted in the continuation of the program for research begun in the year before.

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

Studies of the biological action of X rays.—Progress during the fiscal year on the biological action of X rays was limited to preparatory work.

Mitogenetic radiation.—The apparatus for detecting and measuring extremely small quantities of radiation, constructed by Biophysicist Lorenz, the so-called "Geiger radiation counter" was further developed and improved during the year. Further attempts were made to demonstrate this radiation by photographic means. The results were negative.

Biological studies of mitogenetic radiation.—Further effort was also made to demonstrate the presence of mitogenetic radiation through biological means.

Siebert had reported that tetanized frog's muscle was an active source of this radiation, the increase in the percentage of budding in yeast cells being used as an indicator. Siebert's experiments were carefully repeated a number of times at the cancer investigations laboratory, using the methods and technique described in Siebert's paper, but with negative results.

With the aid of Assistant Surgeon Binford, a study was made of the natural variability in the percentage of budding cells taken from different areas in the same yeast culture, all cultures utilized being grown under standard conditions. As the result of a very large number of counts, the conclusion was reached that, in the same yeast culture, there might be a variation of ± 10 per cent in the percentage of budding yeast cells in samples taken from different parts of a culture presenting an entirely homogeneous appearance.

Electromagnetic radiation.—Further studies were undertaken on the biological action of very high frequency electromagnetic radiation. Studies were also made (*a*) as to the direct heating effects of such very high frequency currents upon mice; (*b*) of the heating effects on solutions of electrolyte (KCl) in relation to frequency and to concentration; (*c*) of such currents on solutions of electrolyte to which various organic materials, such as serum albumen had been added; (*d*) studies of the heating effects of high frequency electrostatic fields upon various tissues and organs (brain, liver, spleen, muscle, blood)

in relation to frequency, and (*e*) studies, at high frequency (1.08×10^8 cycles per second) of the dielectric constants of various tissues, organs, and organic fluids. The data derived from these studies are now being assembled with a view to publication.

BIOLOGICAL INVESTIGATIONS

Study of the general problem of immune reactions to malignant growths was continued by Biologist H. B. Andervont. They have included (1) studies of immunity to malignant growths; (2) effects of temperature upon the growth of tumors and the development of resistance; (3) time required for production of maximum resistance; (4) sex differences in induced immunity; and (5) inhibition of the immune reaction. The results of these studies have been prepared for publication in the Public Health Reports.

Cross immunity studies.—A natural extension of the immunity studies is the investigation of the extent to which resistance to the implantation of a tumor of high growth energy, such as mouse sarcome 180, confers resistance to other transplantable tumors, and conversely.

In the case of two epithelial tumors propagated at the cancer laboratory, namely, mouse carcinoma M 63 and a strain of transplantable adenocarcinoma developed there, it was found that, while both these tumors give a high percentage of takes in control animals, from 65 to 70 per cent of mice which had previously been immunized to sarcoma 180 were likewise resistant to the implantation of both of these strains of carcinoma. On the other hand, mice resistant to either of these carcinomas were not rendered resistant to sarcoma 180.

Because of the results of these experiments, other strains of transplantable tumors have been obtained through the courtesy of Dr. Francis C. Wood, director of the Crocker Institute for Cancer Research, and preliminary experiments with respect to cross immunity between sarcoma 180 and these various strains are in progress.

Effects of immunity to a transplantable tumor upon the subsequent development of spontaneous tumor.—Reference has already been made to the circumstance that acquired immunity to sarcoma 180 conferred at the same time resistance to several strains of transplantable carcinoma. Since, morphologically, these tumors resemble the spontaneous mammary carcinoma, both of the Buffalo mouse colony and of the Agourti strain obtained from the Roscoe B. Jackson Memorial Laboratory, at Bar Harbor, Me., it is obviously of interest to determine the effect of immunization to mouse sarcoma 180 upon the subsequent development of spontaneous mammary carcinoma in strains of mice having a high spontaneous tumor rate.

It has not been practicable to carry out this line of inquiry at the cancer investigations laboratory, because the tumor rate in both colonies of spontaneous tumor mice being propagated there is still insufficiently stable to furnish suitable control experiments. Moreover, it has been found that the Buffalo strain of mice can be immunized only with difficulty to mouse sarcoma 180. For these reasons, and through the kind cooperation of Dr. C. C. Little, director of the Jackson Memorial Laboratory, arrangements have been made to pursue this line of investigation at that institution, where strains of mice are available, having both a high and stable spontaneous tumor

rate and which, at the same time, may be readily immunized to sarcoma 180.

Rous fowl sarcoma.—Work on the problem of immunizing chickens against the Rous fowl sarcoma, in order to study further the nature of resistance to this type of tumor, was resumed in the spring of 1932 upon a larger scale.

Cytological studies.—Concurrently with the work now in progress at the Jackson Memorial Laboratory, and in consultation with Dr. and Mrs. Warren H. Lewis, of the Carnegie Foundation, Biologist Andervont is conducting, at the Mount Desert Island Biological Laboratory, cell culture studies with the object of ascertaining the effect, if any, upon tumor cells of mouse sarcoma 180, of growing these cells in tissue cultures in a medium containing the plasma of mice immune to this tumor.

BIOCHEMICAL STUDIES

The primary concern during the first part of the fiscal year has been the equipment and organization of the biochemical laboratory. The necessary apparatus and supplies have gradually been obtained and installed, and through the cooperation of the department of preventive medicine and hygiene of the Harvard Medical School, the necessary physical facilities have been supplied.

Critical review of the literature on the inorganic constituents of malignant tissues.—Biochemist M. J. Shear began a review of the literature upon the inorganic constituents of malignant tumors, particularly with respect to sodium, potassium, calcium, and magnesium, since these bases occur in the body in large amounts and have frequently been asserted to play a significant part in cancer. The literature was exhaustively and critically surveyed, and a manuscript was prepared which will be submitted for publication under the title of "The Rôle of Sodium, Potassium, Calcium, and Magnesium in Cancer: A Critical Review."

Studies of the influence of calcium salts on tumor growth.—Reports in the literature of the retarding influence of calcium salts upon tumor growth warrant further study. Calcium salts were therefore administered by various routes. They were dissolved in the drinking water or mixed with the food, and were also injected subcutaneously, intraperitoneally, and intravenously. The salts employed were the carbonate, the chloride, the lactate, and the gluconate. They were given for various periods before and after inoculations with mouse carcinoma M 63 and mouse sarcoma 180. The dosage and frequency of administration were also varied.

Although 1,000 mice were used in these various experiments, the net results were negative. At times a slight retarding effect appeared to be obtained, but the results were neither regular nor clear cut.

Determination of the calcium ion.—In recent years a number of investigators have published data purporting to show that in cancer there is a decrease in the calcium ion concentration of serum. However, the data as to the calcium ion concentration of serum have been obtained by calculations based on formulas of dubious validity.

Two types of methods were investigated during the year: The first, and most desirable, was the possibility of the direct measurement of calcium ion activity by means of a first order calcium electrode. Although the results so far have not been encouraging, the attempt

to devise a satisfactory first order electrode has not yet been abandoned.

The second is an indirect method in which serum is saturated with a calcium salt of low solubility and the calcium ion concentration calculated with the aid of the solubility product constant. Such a method, in which $CaHPo_4$ is the saturating salt, has already been used provisionally by Shear and Kramer. However, further study is necessary to determine whether by such method accurate data on calcium ion concentration may be obtained. A basic investigation of the equilibria involved when $CaHPo_4$ is equilibrated both with inorganic serum solutions and with serum has been begun. Interesting results which concern interaction with the magnesium have already been obtained. These studies of the equilibria involving Ca, Mg, Po_4, HCo_3, and pH are still in progress.

Action of organic extracts upon tumor growth.—Another line of investigation pursued during the year has been the preparation of extracts and fractions from biological material, and the testing of their action upon the growth of tumors. Extracts of various sorts were made from the Rous fowl sarcoma, mouse sarcoma 180, and mouse embryo under conditions minimizing the possibility of oxidation, i. e., the operations were carried out in an atmosphere of nitrogen and cysteine was added to the solutions.

These substances were administered to tumor-bearing mice with a view to observing any possible effects in reduction of percentage of takes, retardation in tumor growth, or production of immunity. While most of the experiments gave negative results, some encouragement was given when one particular extract of mouse sarcoma 180 was found, in one experiment, to have rendered a number of mice resistant. Although the immunity could not be produced at will, the results were sufficiently encouraging to warrant further experimentation along this line.

The technique devised by Professor Abel, of Johns Hopkins University, to obtain active fractions from biological material has also been employed. A large amount of tumor tissue (sarcoma 180) was obtained and subjected to the fractionation process. At the same time the spleens of the tumor-bearing animals were treated in the same way and the same number and types of extracts prepared from them as from the tumor tissue. The effects of these preparations on the growth of sarcoma 180 were studied upon a large number of mice. The net result was negative.

Action upon tumors of bacterial washings.—Gratia and Linz found that bacterial washings are capable of producing hemorrhage in liposarcomas of guinea pigs, followed by subsequent regression of the tumors. Shwartzman and Michailovsky extended this work and have obtained similar results with mouse sarcoma 180. In collaboration with Biologist Andervont, Biochemist Shear tested Shwartzman's filtrates on mice bearing mouse sarcoma 180, confirming Shwartzman's findings: The filtrate produces hemorrhage in the tumor and, apparently, nowhere else in the mouse; regression of the tumor frequently follows. In some cases recrudescence occurs after a period of regression; in other cases the tumor completely recedes.

Unfortunately this material kills a large proportion of mice when given in doses large enough to produce regression. Attempts were made to produce recession by the repeated administration of well-

tolerated doses. These experiments have yielded essentially negative results.

Studies of fluid exchange in malignant tissue.—Toward the end of the fiscal year studies were begun of the relation of tumor growth to certain physicochemical processes concerned in fluid exchange. Such phenomena as permeability, oncotic pressure, imbibition, and diuresis are being studied *in vitro*, while, at the same time, parallel investigations are being carried out in mice. Inasmuch as calcium salts and acid salts have an influence upon fluid exchange and upon the coagulation of colloids, in carrying out this line of inquiry, attention is being paid to the possibility of finding interesting relationships between the inorganic constituents of cells and these physicochemical processes.

Spontaneous tumor colonies.—Two strains of mice, the well-known Buffalo strain and an Agouti strain obtained from the Jackson Memorial Laboratory at Bar Harbor, Me., have been propagated for the last two and one-half years at the laboratory. Unfortunately, since these strains have been propagated, they have failed to maintain the spontaneous tumor rate to which they were subject in their original environment.

During the past fiscal year an effort has been made, by means of selective breeding, both to increase and to stabilize the spontaneous tumor rate. Until this has been accomplished, it will not be practicable to use these colonies for studies in tumor susceptibility which have been planned.

Cytological laboratory.—Cytologist L. C. Fogg joined the staff at the cancer investigations laboratory on May 23, 1932. He has been engaged in organizing and equipping a cytological laboratory and in certain preliminary studies.

Heart Disease

Medical Director A. M. Stimson was detailed in charge of studies of heart disease effective July 16, 1931, with headquarters at the National Institute of Health.

Much of the work of the year was necessarily of an orienting and organizing character. The officer in charge spent several months in reviewing literature and in making contacts with and consulting specialists in this branch of study before deciding upon the most suitable approach to this complicated problem.

In accordance with the preliminary findings, the experimental features of rheumatic heart disease were selected as the subject of the initial studies, and by the end of January, 1932, active experimentation was well under way. The force consisted of the officer in charge, a medical officer assistant, a bacteriologist, and an attendant.

The plan of work has been restricted to a check on the recent bacteriological investigations in the etiology of rheumatism. While these investigation have been highly suggestive that the right track has been selected for the solution of the problem, the results have apparently been inconsistent in the hands of different observers and have certainly lacked finality. An attempt has been made to combine the favorable methods used by previous investigators and to introduce certain features from which better results might be expected.

The procedure in general has been to secure blood from patients suffering from acute rheumatism with or without heart involvement, to cultivate if possible organisms therefrom, and to expose animals to these organisms by various methods of inoculation. In consideration of what appears to be a strong possibility of a nutritional element in the etiology of rheumatism, a number of these animals were placed on vitamin A deficient diet. The results of this diet constitute a by-product of the principal study of considerable interest in itself, which it is intended to publish when the work is a little further advanced.

Blood specimens have been secured from 32 patients with frank acute rheumatism or with strongly suggestive symptoms. From these, 55 cultures have been secured with which it seemed profitable to work. Twenty-four dogs have been exposed to one or another of these cultures by various methods of inoculation, and the virulence of the organisms for mice and rabbits has been determined. Three monkeys have been used. While several animals have developed cardiac lesions under this treatment, with the exception of one there has been no strong reason to suspect that the lesions were of rheumatic type. In this one case further study, now in progress, will be necessary before a decision can be reached.

Leprosy

The conduct of studies at the leprosy investigation station at Honolulu, Hawaii, has been continued under the direction of Surg. N. E. Wayson; and the medical activities of the adjoining Territorial receiving station and hospital have been directed and executed by him with the assistance of Passed Asst. Surg. J. R. Murdock.

The treatments used during the past year may be classified as hygienic, stimulative, corrective, and symptomatic. Hygienic measures include those which are customarily so regarded, and the routine administration of cod-liver oil. All patients have an established rest period during the middle of the day. An adequate diet is provided, but the adjustment of the dietary remains a troublesome problem. Stimulation to the general metabolism and to special tissues, such as those of the skin, have been obtained by the injection of irritant substances into the muscles or skin; but an increasing use has been made of prolonged hot baths, ultra-violet light exposure, and diathermy for this purpose. By each of these methods an attempt is made to induce a febrile reaction of several hours' duration, or to effect an active congestion of the blood vessels in the surface or member treated. The corrective and symptomatic treatments are applied for the relief of complicating conditions.

The progress of each patient is watched through systematic weekly inspections and monthly examinations, to which are added such special examinations as may be indicated.

These changes in methods have been made possible during the past six months by the construction and equipment of a 44-bed infirmary, and a dispensary, and by the provision of a small group of trained nurses and attendants.

Clinical studies.—An investigation was made of the therapeutic effect of the addition of a definite amount of an extract of wheat, or of yeast to the customary diet of patients. Three groups of about 20 patients each, whose ages and leprous condition were comparable,

were selected, and to each of two groups was given daily during a period of six months either 15 grams of an extract of whole wheat, evaporated to the consistency of a heavy sirup, or 3 grams of dried brewers' yeast suspended in a coffee decoction. The third group was used for control. To all three groups 10 cubic centimeters of cod-liver oil (U. S. P.) has been routinely administered daily. The purpose of the test was to determine the effect of such amounts of the vitamin B complex in the dietary. Both groups showed changes which may be rated as slightly greater improvement than the control group, but it is not felt that the differences are such as would permit of definite deductions.

An analysis of the food eaten during a 5-day week was made on 10 patients who were selected as representatives of the different age groups and nationalities included among the residents of the hospital. Analyses were made of duplicate samples of each meal consumed for their content of protein, fat, carbohydrates, and ash. The conclusions of the study were that all the patients consumed an ample quantity of food in terms of calories, and that both adults and children were prone to select and eat a higher carbohydrate diet than is customary among American and European families. However, though the adults showed a retention of the dietary tendencies of their respective races, they included a larger intake of protein and of fat in their selection than seems customary among them. It seems justifiable to conclude from this study that the patients eat a diet which is suboptimum in protein and fat, and definitely low in fruits and vegetables.

The presence of the bacillus in the circulating blood has apparently been demonstrated in 8 of 12 selected cases examined. The examinations have been made of preparations on slides from the entire sediment of 3 cubic centimeters of blood, which has been withdrawn from a superficial vein into a sterile syringe by puncture through the skin; and hemolyzed with acetic acid and distilled water which has been sterilized in the autoclave. The criteria for the acceptance of the finding have been that the bacilli shall be in the white blood cells, or in clumps of two or more.

This very suggestive evidence of a bacteremia of high grade has been of particular interest with regard to the explanation of acute manifestations of the disease which have been considered phenomena of allergy. The positive results have been obtained usually from the blood of cases showing acute clinical changes.

Epidemiological investigations.—During the year a survey was made of features bearing on the epidemiology of leprosy in Hawaii. Epidemiologist Theodore Rhea carried out the details of the work. The survey consisted of the compilation and analysis of the hospital admission records of the past 40 years, of those of 420 families from whom a representative was in segregation or under supervision, and of a house-to-house field investigation of 100 of the 420 families. The economic status, housing, environment, dietary, and family contact of the 100 families were appraised.

The results of the survey have been confirmatory of some hypotheses which have been advanced to explain phenomena of the disease, and have thrown much doubt on the validity of others which have a rather wide acceptance. There seems to be ample evidence that the incidence of leprosy is declining in the native people, and that an

increasing proportion of the admissions during the past 10 years have arisen from among those who have been imported to the islands, until at the present time about 40 per cent of the admissions originate among this latter group. It also appears that the rates of admission among native children of the younger ages have been much higher than those for individuals of the older ages, or in other words the rate of attack among young children, 5 to 15 years of age, is probably the highest of any age period. The decline in admissions has also been greater in this young group.

There was no selective predilection to attack apparent amongst families of Hawaiian, part Hawaiian, or Portuguese composition; but there is a greater percentage of males than females of all ages admitted. The proportion has averaged 100 females to 160 males.

The period of exposure to the disease which is followed by its development seems to vary with the age of the individual exposed and with the probable intimacy of the contact with the case. Among fifty-odd families, there were 25 to 35 per cent of the children under 10 years of age who were admitted with leprosy subsequent to their exposure to leprous parents. A relatively large number of these were admitted by the time they were 15 years of age. The period of incubation or that from the probable date of exposure to the recognition of the disease also seems to have some correlation with the age of the individual at the time of his exposure, and the degree or intensity of his contact with a case.

It was found that the average standard of living prevailing among the 100 families would be classed as one of indigence by the local welfare agencies. Their diet is not balanced, and is lacking in milk and meat proteids, butterfat, and fresh vegetables. Housing conditions, environment, and personal habits are conducive to a very intimate and rather promiscuous contact among members of the household who may be sick or well. While these conditions would appear favorable to the dissemination of the disease, there did not seem to be any correlation among this group of families between the better and lower average standards and the frequency of leprosy. However, the average frequency of leprosy within the families did seem to have a direct relation to the history of contact with extrafamilial cases.

Experimental investigations.—Experiments have been continued on a larger scale in the attempt to isolate and to grow the bacillus of leprosy, and to determine the effects of poorly balanced diets on rats with regard to the readiness with which rat leprosy will grow in the individual rat, or to the development of infection from inoculations of materials from the lesions of leprosy in man.

Forty types of culture media were prepared and inoculated with material from leprous individuals and from rats infected with the bacillus of rat leprosy (Stefansky's bacillus). Different sources and types of bacillus-bearing material were used for the inocula. The culture media included albuminous products, potato, carbohydrates, glycerine, soaps, fatty acids, amino acids, dyes, embryonic tissues, and fluids and were adjusted to various reactions from 6.0 to 7.5 pH. The cultures were maintained under anaerobic and aerobic conditions, and under conditions of definite mixtures of carbon dioxide and oxygen for periods as long as five months. In but one instance was an acid-fast bacillus cultivated which resembled the bacillus of leprosy in its morphology.

The organism cultivated produces an orange-colored pigment in the presence of air, and its growth on media is that of a dry, wrinkled pellicle. Egg-mixture media are slowly liquefied by its growth. Its pathogenicity to rats and guinea pigs is under test. An attempt to make a vaccine of it has not been successful, because of its tendency to agglomerate, even after treatment with acetone, chloroform, ether, and alcohol. There is no conclusive evidence that the organism is identical with the bacillus of leprosy, but it is an acid-fast bacillus and was obtained from cultures inoculated with material from a leprous case. When injected into animals it produces nodules at the site of inoculation, which ulcerate in most instances, and the organism can be recovered from the lesion. The cellular response within the peritoneal cavity to intraperitoneal injections of the organism is similar to that obtained by the injection of material from rat leprosy and from leprosy in man.

In addition to these efforts at cultivation in media, attempts have been made to grow the bacilli of human leprosy and of rat leprosy in tissue cultures. The tissue cultures were made of chick embryo, the plasma of guinea pigs, with tyrode solution and the embryonic juice of chicks. Material from seven sources of human leprosy and three sources of rat leprosy has been planted in such cultures. In three instances of the cultures of human material there has apparently been a proliferation of the acid-fast bacilli planted and a definite growth of a diphtheroid in from five to seven days after inoculation. All of these cultures have been carried through several transplants, and one of them through 15 transplants. The acid-fasts in the last transplants seem to be as numerous as in the original culture, but colonies visible to the unaided eye have not been obtained. The material from rat leprosy has been under observation but a short time, but in one instance there has apparently been a proliferation of the acid-fast bacilli accompanied by a growth of a diptheroid.

Different sites of inoculation of rat leprosy in rats have been studied in an effort to determine the probable route of invasion in nature. Intranasal installations of tissue suspensions of the bacilli of human or rat leprosy are rather consistently followed by the appearance of the organisms in the adjacent lymph glands. In one instance a definite take of rat leprosy was obtained by this method in a cervical lymph node and the surrounding tissues, and scattered organisms have been found in remote tissues; but with the one exception there has not been satisfactory evidence of a take.

During the latter nine months, investigations were in process on the effects of diet on the course of rat leprosy, and on the development of infection in rats, guinea pigs, rabbits, and cats from the injection of material from human leprosy. These experiments have been conducted by feeding rats and guinea pigs on a deficient diet, inoculating them, and, after four to five months of a continuation of the diet, examining them in comparison with animals fed on a balanced ration. The results of these experiments will not permit of definite conclusions at this time.

Educational and cooperative activities.—A series of clinics has been presented to physicians, and clinical demonstrations and lectures have been given to public health nurses and social workers, as well as lectures to educational groups. Ward walks have been conducted for all applicants for medical licensure in the Territory.

The junior medical officer, Passed Asst. Surg. J. R. Murdock, acted as the medical officer for the Board of Leper Hospitals and Settlement for a period of eight weeks, during which time he took a group of patients to Manila, P. I.

MALARIA

Field investigations of malaria have continued under the direction of Surg. L. L. Williams, jr.

During the fiscal year 10,000 blood indices were taken in the experimental areas, with the general average of almost 5 per cent positive. We can not deduce from these figures that the malaria rate has fallen from areas where active control has been in operation for at least three years. Analysis of all the available figures of the blood indices shows that the rate is probably not in excess of 10 per cent. This figure indicates something over 2,000,000 cases of malaria annually in the southeastern part of the United States.

DUSTING STUDIES

Paris-green dusting at 10-day intervals.—This study was continued in Dougherty County, Ga., under the direction of Surg. T. H. D. Griffitts, and was completed toward the end of the fiscal year. It will be made the subject of a separate report. The work has been so satisfactory and the results so apparent that the county has taken over this experiment as a permanent means of county-wide malaria control.

Twenty-one day dusting interval.—This is the third year of the intermittent dusting with Paris green in Dyer County, Tenn., under the supervision of Senior Sanitary Engineer J. A. LePrince and Passed Asst. Sanitary Engineer H. A. Johnson. The results of the 1930 drought had not worn off in 1931, and so this experiment was continued for another season to check the present figures. The results indicate that the method is proving successful.

Flotation of Paris green.—The study of floating Paris green has been continued. The observations of the past year have confirmed previous studies indicating that three to five days is the longest period we can expect one application of floating dust to keep the breeding areas free of larvae. Occasionally there was no appreciable interval between the killing of the crop of larvae in the water and the reappearance of a new one. Some experiments were tried of mixing Paris green in plaster of Paris and allowing it to set on a piece of cork which was then placed in the water. *Anopheles* seemed to feed freely upon the poison liberated from the slowly disintegrating mass. Although inconclusive, the results of these studies are sufficiently interesting to warrant their continuation.

OTHER MALARIA STUDIES

Malarial inoculation in paresis therapy.—In cooperation with the Division of Venereal Diseases, the preliminary observations commenced last year on the feasibility of supplying malarial infection from a central point to hospitals using malarial infection in the treatment of paresis were continued.

Special Expert Bruce Mayne has succeeded in readily infecting *Anopheles quadrimaculatus* and *Anopheles punctipennis* with benign

tertian by bites on a good malaria carrier, but not from blood drawn from such patients. He has experimented with various methods of shipping malaria by means of blood drawn from the patients, by live infected mosquitoes, and by suspensions of sporozoites from the salivary gland of infected mosquitoes. These tests have been carried on on 62 paretics in 7 hospitals. So far 36 of these cases have been reported upon, with 8 positives and 28 negatives.

A strain of quartan malaria has been established at the State hospital for insane in Columbia, S. C. A little less than 3 per cent of the mosquitoes (*Anopheles punctipennis*) subsequently showed evidence of infection, but none of the mosquitoes fed upon new patients proved themselves to be infected with quartan.

During the progress of these studies and in cooperation with Surg. T. H. D. Griffitts, it was definitely proved that *Anopheles atropos* (the salt water *Anopheles* of the Gulf coast) is easily infectible with benign tertian and is capable of transmitting the infection to man. (Public Health Reports, December 25, 1931.)

Plasmochin.—Sanitary Engineer W. H. W. Komp, with headquarters at Panama in the Canal Zone, has been carrying on biological observations on anopheline mosquitoes, testing certain prophylactic measures and cooperating in the research work in malaria carried on through the Gorgas Memorial Laboratory. One problem has been to test the value of plasmochin as a prophylactic agent in the prevention of malaria. Although not yet definite, results are very encouraging.

Preliminary tests in the treatment of benign tertian made with the new synthetic drug "Atebrin" seem to give such good and almost startling beneficial results that a relatively large amount of the drug has been secured and extensive tests have been begun.

In addition, many biological observations and studies have been initiated and new species of mosquitoes have been found. Assistance to the Army has been given in directing their successful efforts to dust large swamps by airplane, and preliminary tests have been made of oiling by airplane.

Airplane convection of mosquitoes.—In cooperation with the Division of Foreign Quarantine, a study of the transportation of mosquitoes by airplane was begun in July, 1931. Surg. T. H. D. Griffitts examined the planes arriving at Miami, Fla., and established the fact that approximately 20 per cent of all planes arriving from tropical countries brought one or other species of mosquito with them. (Public Health Reports, November 20, 1931.)

Surgeon Griffitts and Sanitary Inspector Fred Franz then went to San Salvador, Central America, and liberated *Aëdes aegypti* into planes going both to Brownsville, Tex., and Miami, Fla. Although many of these flights included three stops, the planes upon arrival would yield from 5 to 20 per cent of the initial loading of mosquitoes. It is of interest to note that altitudes of 15,000 and 16,000 feet seemed to have no deleterious effect on the *Aëdes aegypti*.

Subsequently Mr. Franz was sent to Panama to repeat the loadings. Similar work will be pursued from ports in South America in an attempt to determine whether there is any limit to the length of flight beyond which *Aëdes aegypti* may not survive.

The Pan American Airways are cooperating in devising a chemical means of automatically spraying every plane so as to destroy all mosquitoes en route.

There is danger of the introduction of yellow fever by means of infected *Aëdes aegypti*; but greater danger, however, is apprehended through the introduction of new species of insects not indigenous to the United States, one or more of which may prove dangerous.

The staff of field investigations of malaria have advised concerning impounded water problems, made surveys of salt marsh mosquito breeding areas at Mullet and Egmont Keys, Fla., the coastal areas about Galveston, Tex., and the southeastern coast of Virginia and aided in similar work in Delaware and Maryland, and have tested the effectiveness of numerous larvicides and methods of mechanical distribution of oils. The most interesting results in these tests were the negative results obtained with ferric chloride, which will not floc in acid waters, and the positive results with pyrethrum extracts, some of which, even in nonvolatile oils, have proved efficacious in destroying both anopheline and culicine larvae. In cooperation with Dr. H. G. Grant of the Virginia State Board of Health, a portable mechanical pressure spraying apparatus is being developed.

Nutritional Diseases

The studies in nutrition have continued to be centered largely on pellagra with, however, increasing emphasis on the problem of its control. But to combat successfully this disease under the economic and dietetic conditions which prevail in many sections of the rural South, preventive measures must be further simplified and the methods of their application rendered more feasible. To this end, work is being directed to the determination of the relative pellagra-preventive potency of the foodstuffs which may be most easily and cheaply produced at home, especially those which may be made available during the late winter and early spring when the diet is normally most restricted and the foundation is laid for the seasonal crop of pellagra.

As in previous years, these studies have been conducted both at the Milledgeville State Hospital (formerly the Georgia State Sanitarium), Milledgeville, Ga., and at the National Institute of Health, Washington.

The work at the Milledgeville State Hospital was under the supervision of Surg. G. A. Wheeler until July 15, 1931, since which date it has remained under his general direction with Asst. Surg. D. J. Hunt in local charge.

The study of the pellagra-preventive value of green peas, collard greens, and cabbage greens was completed during the year. Green peas and collard greens were found to be satisfactory preventives. Cabbage greens contain the preventive factor, but are somewhat inferior to green peas and collard greens in this respect.

Similar studies of mustard greens and kale greens, begun during the first half of the fiscal year, are still in progress.

The results of the study of the pellagra-preventive value of turnip greens, spinach, green beans, and mature onions (described in last year's report) were published in the Public Health Reports (vol. 46, November 6, 1931, pp. 2663–2668).

A paper on the history of pellagra in the United States, presenting historical data collected in the course of field studies, was published in the Public Health Reports (vol. 46, September 18, 1931, pp. 2223–2229. Reprint 1510.).

A paper on the control of pellagra, together with an exhibit setting forth information on its nature and prevention, was presented at the meeting of the American Medical Association in New Orleans, La.

The policy of extending cooperation to various agencies concerned in combating pellagra, as well as those concerned with nutrition problems generally, has been continued and to an increasing degree. This has included a study of the conditions, with appropriate recommendations for the control of pellagra, in Richland Parish, La., Hamilton County, Tenn., and Bell and Whitley Counties, Ky. Public talks on pellagra were made in all these counties, and pellagra clinics were held in Bell and Whitley Counties, Ky. Lectures on pellagra were delivered at the conference for county health workers for western Kentucky and at the State school for health officers conducted under the auspices of the University of Kentucky. A paper on pellagra was presented before the Society of Hygiene, Baltimore, Md. Assistance was furnished the Committee on Standardization, United States Pharmacopoeia X, and to the nutrition service of the American Red Cross.

A survey was made of dietary conditions and pellagra incidence in portions of the soft coal mining district of southeastern Kentucky and the hard coal mining section of northeastern Pennsylvania. The diet of the soft-coal miner was found to be the characteristic diet of the rural South, the dominant items being corn bread, biscuit, salt pork, lard or lard substitutes, and small quantities of dried beans and the cheaper canned foods; while that of the hard-coal miner is more typically northern in character, being dominated by fresh meats, milk, and vegetables. In the former area pellagra was found to be quite prevalent, while in the latter it is very rare.

The laboratory studies at the National Institute of Health were under the immediate supervision of Passed Asst. Surg. W. H. Sebrell until July 15, since which date the work has been in charge of Surg. G. A. Wheeler, with the assistance of Passed Assistant Surgeon Sebrell.

As for the past several years, the laboratory studies have been correlated with those in the human and for the most part have been concerned with the determination of the probable pellagra preventive value of individual foods and foodstuffs by tests in the dog.

Tests of canned mustard greens, canned spinach, canned turnip greens, green lettuce leaves, canned collards, Irish potatoes, canned corned beef, and canned evaporated milk were completed during the fiscal year.

The canned corned beef, canned evaporated milk, canned turnip greens, and canned collards showed satisfactory preventive value. Canned spinach and canned mustard greens showed some degree of protection, but were less satisfactory. The Irish potatoes showed little or no protective value.

Tests of navy beans, red kidney beans, canned chicken, buckwheat flour, and peanut meal, begun during the fiscal year, are still in progress.

The detailed report of the studies on fatty degeneration of the liver in dogs was completed and submitted for publication. The results indicate that the condition is based on a dietary deficiency.

In collaboration with Senior Chemist E. Elvove, of the Division of Chemistry, studies were continued on rat methods for the quanti-

tative estimation of the antipellagric vitamin, and a few crude fractions were prepared and studied.

A special report was made of studies on the toxicity of several amino acids. (Public Health Reports, vol. 47, January 8, 1932, pp. 75–83.)

PLAGUE

At the request of the Governor of the Territory of Hawaii, and with the approval of the Secretary of the Interior, the Public Health Service undertook, in cooperation with the Territorial health authorities, work in connection with the control and eradication of bubonic plague in the Hawaiian Islands. Surg. C. R. Eskey was detailed in charge of these studies and work was begun upon his arrival in Honolulu on November 24, 1931.

The last human case of plague on the island of Hawaii, Hamakua coast, occurred August 13, 1929. In July, 1931, a case of human plague was found on the island of Maui, several miles from the port of Kahului. Plague-infected rats have been found on these islands during the fiscal year.

Plague suppressive measures instituted by the Territorial health authorities, including poisoning, trapping, and laboratory examination of rats, and the ratproofing of buildings, have been continued and extended. In addition a flea survey and a study of the flea infestation of rats have been undertaken.

There follows a report of the flea survey covering the period April 1, 1932, to June 30, 1932.

Report of flea survey conducted as part of plague studies in Hawaii from April 1, 1932, to June 30, 1932

RODENTS AND MONGOOSES SEARCHED FOR FLEAS

	Honolulu laboratory	Kahului laboratory	Honokaa laboratory	Hilo laboratory	Total
Rats	1,327	1,172	846	273	3,618
Mice	267	296	216	55	834
Mongooses	92	30	54	13	189
Total	1,686	1,498	1,116	341	4,641

CLASSIFICATION OF FLEAS

	Honolulu laboratory	Kahului laboratory	Honokaa laboratory	Hilo laboratory	Total
Xenopsylla cheopis	3,731	947	402	450	5,530
Leptopsylla segnis	----------	252	868	4	1,124
Ceratophyllus fasciatus	----------	351	36	----------	387
Unknown [1]	75	394	320	7	796
Echidnophaga gallinacea	953	497	273	11	1,734
Ctenocephalides felis	806	204	162	90	1,262
Pulex irritans	----------	----------	1	1	2
Total	5,565	2,645	2,062	563	10,835

[1] Probably belongs to Xenopsylla family.

Rocky Mountain Spotted Fever

The study of Rocky Mountain spotted fever and other tick-borne diseases of the western United States has been continued at the Hamilton (Mont.) field station under the direction of Special Expert R. R. Parker.

During the year there was an unusual augmentation of the volume of work performed. This has been occasioned in part by a necessary increase in routine required by the production and distribution of a much larger amount of Rocky Mountain spotted fever vaccine than heretofore, in part by an expansion of the scope of the station work, and by the increase in demands made upon the station for information and for diagnostic tests of various kinds.

On February 2, 1932, the building which had been occupied previously by the Hamilton station under lease was purchased by the Public Health Service from the State of Montana as provided by the act of February 27, 1931. It is expected that the cornerstone for the new laboratory building which was also included in the provisions of this act will be laid early in the spring of 1933.

Vaccine.—Three hundred and eighty-three lots of 400 cubic centimeters each (totaling 153.2 liters, gross) were manufactured, as compared with 293 cubic centimeters (117.2 liters) in 1931, and 125 cubic centimeters (55 liters) in 1930. Of the 1932 supply, 222 lots, netting approximately 73 liters, were suitable for use. This was about 58 per cent of the gross production.

Two improvements in the manufacture of this vaccine have been made: (1) A technique has been developed by which phenol alone can be used as the preserving agent instead of the phenol formalin mixture now employed; and (2) a mechanical grinder suitable for comminuting the tissues of infected ticks, an essential part of the process of vaccine production, has been secured.

The demand for vaccine, which has increased each year, was 75 per cent greater than in 1931, the entire supply of 73 liters being entirely exhausted soon after the middle of the 1932 tick season. The resources of the present laboratory were heavily overtaxed, however, to produce even this amount. It is likely that at least 100 liters could have been used had it been available.

Tick parasites.—Studies of tick parasites as a possible agency for the control of *Dermacentor andersoni* in the Rocky Mountain region were begun by the State of Montana in 1926. These studies were taken over by the Public Health Service on July 1, 1931, and are being carried on under the immediate supervision of Entomologist R. A. Cooley. During the year this work has consisted mainly of the biological study, mass rearing, and experimental liberation of a chalcid fly, *Ixodiphagus caucurtei* du B. The earlier liberations were confined to Montana, but this year colonies are being started in Colorado, Idaho, and Oregon, following necessary preliminary surveys to select suitable localities and secure needed information pertaining to the local tick complexes.

Thus far it has been definitely shown that the parasites attack *D. andersoni* in nature; and in the Bitterroot Valley, where most of the experimental work has been carried on, survival over winter has been demonstrated in two successive years. The data, however, do not yet justify an assumption that this parasite will be able to perpetuate itself indefinitely under Montana conditions.

Experimental studies.—The transmission experiments begun in 1929, to determine what western species of ticks other than *Dermacentor andersoni* are actual or potential carriers of Rocky Mountain spotted fever virus in nature or to man, are still being carried on.

In the transmission experiments, the following tick species have been tested, using highly virulent Bitterroot Valley (Montana) strains of virus: With *D. variabilis*, transmission has been secured by each successive stage from the larva of one generation through the larva of the next; with *D. parumapertus* (tests just begun) transmission by adults infected as adults; with *D. occidentalis*, by adults reared from larvae infected as such (tests begun in 1929), and by larvae hatching from eggs laid by infected adults; with *A. americanum*, infected as adults, by the resultant larvae and nymphs; and with *R. sanguineus*, by each successive stage from the larvae of one generation through the nymphs of the next. With three of the species concerned, these results merely confirm or extend those of other workers.

The results of these tests in conjunction with others previously made show that one or more proved or potential tick carriers of Rocky Mountain spotted fever to either man on animals occur in all 48 States.

Tests of species from nature shown to be potential carriers have been limited by the difficulty of securing material in sufficient quantities to make them worth while. In 1931, tests of over 11,000 specimens of *D. veriabilis* and *Haemaphysalis leporis-palustris* from Minnesota were made in cooperation with Dr. R. G. Green, of the University of Minnesota Medical School. With over 1 per cent of the former and 2 per cent of the latter, reactions were secured in guinea pigs, which, had they occurred in tests of ticks from a known endemic area, would have been considered indicative of a low-grade Rocky Mountain spotted fever virus. Similar, though slightly less suggestive, results have been secured with *D. occidentalis* from California. Decision as to the full significance of these tests must await further study.

Additional observations of the agglutination of *proteus* X_{19} and X_2 organisms by the sera of persons acutely ill of Rocky Mountain spotted fever and by convalescent sera suggest that the value of this test for diagnostic purposes in the Rocky Mountain region is limited by the following findings: (*a*) The affinities of the agglutinins of such sera are so broad that no one strain or group of strains can yet be designated safely as most advantageous for routine work; and (*b*) though apparently diagnostic in a fair percentage of cases when the sera are secured later than the middle of the second week after onset, there is nevertheless a considerable proportion of cases in which the agglutinin titer is never higher than that frequently encountered with supposed normal sera. This test has little or no value if the sera are secured after a considerable interval following recovery. The agglutinin titer is not related to degree of immunity. Convalescent sera have no bactericidal action on *proteus* X organisms.

Tests to determine the limitations and diagnostic value of protection tests with convalescent sera are being made. So far as the Rocky Mountain region is concerned, the data thus far secured suggest that, if the sera used are secured shortly following recovery this test is more accurate for diagnostic purposes than either the above agglutination reaction or, all contingencies considered, attempts

to recover infection by the injection into guinea pigs of the blood of persons acutely ill.

Sexual transmission (infection of normal ticks of one sex by an infected tick of the opposite sex during copulation) of the virus of Rocky Mountain spotted fever has been demonstrated in *D. andersoni*.

Observations relative to the factors underlying the difference in virulence of Rocky Mountain spotted fever in various areas are being continued. For several years this study has centered in the Bitterroot Valley, where a highly fatal type of infection has long existed on the west side and a very low-grade, inapparent type has been supposed to be the only type on the east side. It now appears possible that the value of these studies may be impaired by the facts that during the past few years several frank cases of apparent east side origin have occurred and that in several instances strains of considerable virulence have been recovered from east-side ticks. Whether or not these typical infection-producing east-side strains are of recent introduction is not clear.

Attempts to grow the virus of Rocky Mountain spotted fever in "K" and other media have failed. Negative results have also been secured in attempts to isolate *proteus* X organisms from the urine of patients and guinea pigs acutely ill.

Epidemiology.—The season of 1931 was one of low prevalence of Rocky Mountain spotted fever throughout the greater portion of the Rocky Mountain region. Although the 1932 records are incomplete, they indicate an increased incidence in certain sections, but particularly in eastern Montana, where the number of cases has been the largest since the disease was first recognized in this section in 1914.

In conjunction with the increased prevalence of Rocky Mountain spotted fever in 1932, infection has been reported from an unusually large number of areas in which it had not been known previously. Whether this is the result of intensive spread, of a rise in the level of virulence of long resident local strains of the virus, or is due to other causes, is not apparent. In at least some of the sections concerned there has been an unusual abundance of ticks.

Reports of the last few years, as previously noted, have suggested that the highly fatal type of Rocky Mountain spotted fever that has long been resident in the Bitterroot mountain region of western Montana, actually exists in nature over a much larger section of western Montana and the greater part at least of the mountainous section of northern Idaho.

For the first time cases proved or suspected to be Rocky Mountain spotted fever were reported from various sources during 1931 in the following States lying west of the Mississippi River: Louisiana, Texas, Arkansas, Missouri, Iowa, Minnesota, and Arizona. So far as known, the Texas report is the only one to have been fully substantiated by laboratory tests.

During the spring of 1932, two fatal cases of presumed secondary infection incidental to bites of *D. andersoni* have been reported—one from Colorado, the other from Montana.

TULARAEMIA

During the late summer of 1931 an epizoötic among sage hens, near Roy, Fergus County, Mont., was investigated and a report of the findings published in the Public Health Reports, February 26, 1932.

As a result of reports of several instances of human tularaemia infection in which mosquitoes were mentioned as possible agents of transmission, experimental studies were made to determine whether or not these insects may function in this manner. Tests made with *Aëdes aegypti* and several local species of mosquitoes have shown that occasionally infection can be transferred mechanically between infected and healthy laboratory animals by undelayed interrupted feeding, by crushing infected insects on the unbroken skin, or by deposition of excrement on the abraded skin of such animals. Infection was recoverable for varying periods up to 39 days in one lot as demonstrated by injection of the macerated bodies of infected mosquitoes into normal guinea pigs. It was concluded that suitable conditions to effect such transfers in nature are likely rare, and that it is probable that at most only infrequent infection of man would occur in this manner.

Incompleted transmission experiments with various species of ticks and with blood-sucking insects other than mosquitoes have given the following results: Horseflies (*Tabanus ruprestris* and *T. septentrionalis*), mechanical transmission between guinea pigs by interrupted feeding; black flies (Simuliidae), preliminary tests inconclusive, although one test by interrupted feeding was negative with a fly shown to be infected by subsequent injection; sucking louse of the Columbian ground squirrel (*Neohaematopinus laeviusculus*), positive results between ground squirrels; American dog tick (*D. variabilis*), infected as larvae, transmission by resultant nymphs, but not by adults, though the latter were proved infected by injection into guinea pigs; Pacific coast tick (*D. occidentalis*), transmission by adults infected as adults; *D. parumapertus*, same as with *D. occidentalis;* brown dog tick (*R. sanguineus*), infected as larvae, transmission by resultant nymphs and adults.

Two instances of complete loss of agglutinins following tularaemia infection in man and two cases of reputed second infections have been reported to the station.

The badger (*Taxidea taxus*), which preys upon rodents highly susceptible to tularaemia, has been tested for susceptibility and found resistant.

Tick Paralysis

During the spring and early summer of 1932 a number of reports of tick paralysis were received from western Montana, northern Idaho, and eastern Washington. A greater incidence than is usual has been indicated. Two reports were of paralysis in dogs. All were induced by *D. andersoni*. In several instances the tick responsible was sent to the station, but none accepted a second feeding, doubtless due to injury received when removed, or to the application of turpentine or other chemicals.

Colorado Tick Fever

Colorado tick fever was prevalent during 1932 in several sections of Colorado. A few cases occurred in northern Wyoming and northeastern Utah, and two possible cases in southeastern Oregon. Fortunately, a female tick supposed to be responsible for a Colorado case was forwarded to the station; and though it has failed to produce

symptoms in a guinea pig while completing engorgement, it is hoped that the progeny will prove infected and that an opportunity for etiological studies will thus be afforded. Sera received from supposed cases and convalescent sera have failed to agglutinate *proteus* X organisms except in low titer, nor has blood from patients ill of this disease caused any observable symptoms in either guinea pigs or white rats.

Relapsing Fever

An infestation of *Ornithodorus turicata* in a summer cabin in the mountains near Moscow, Idaho, has been reported by Prof. Claude Wakeland, of the University of Idaho. Two undiagnosed illnesses suggestive of relapsing fever, have occurred in the owner's family in the past two years during periods of residence at the cabin. Ticks collected by exposing laboratory animals in the cabin are under test at the present time for the possible recovery of relapsing fever. The nearest previously known locality infested by this tick is in the vicinity of Lake Tahoe, Calif.

Child Hygiene Investigations

The activities of the Child Hygiene Office were continued under the direction of Acting Asst. Surg. E. Blanche Sterling.

A STUDY OF CHILDREN OF PSYCHOTIC PARENTS

A study of children of psychotic parents, begun in the last quarter of the fiscal year 1931, was completed in April, 1932.

The psychotic patients were selected from the Spring Grove State Hospital, Catonsville, Md., the psychopathic section of the Baltimore City Hospital, and the Springfield State Hospital, Sykesville, Md.

In order to evaluate properly the findings in respect of the children of psychotic parents, it was necessary to compare them with other groups of children. These control groups were selected from the Henry Watson Children's Aid Society and the Jewish Children's Society, representing children from broken homes; from the Child Guidance Clinic of the Maryland Mental Hygiene Society, representing problem children; and from a previous study made by the Public Health Service, representing normal children.

The generous cooperation of these Maryland agencies was obtained through Dr. George H. Preston, the director of the study, who is the Maryland State commissioner of mental hygiene.

The major purposes of the study were to determine whether these children indicated by their behavior any serious need for psychiatric assistance, and whether the children of psychotic patients constituted a profitable foundation on which to base a mental hygiene program.

The study brought out the significant facts (corroborating studies of other investigators) that, among psychotic patients, there is a low marriage rate, a high sterility rate, and a tendency to small families.

It seemed fairly clear that the psychotic patients of the preceding generation constituted only about 3 per cent of the present Maryland State Hospital population.

In spite of the fact that the children of psychotic parents were subject to a double handicap, having both a poor heredity and an unfavorable environment, they showed less frequent deviations from an accepted "normal behavior pattern" than did the group of unselected children from a rather better-than-average public school.

It was also shown that, on the whole, the children of psychotic parents showed far less deviations from so-called "normal behavior" than the children in the problem group.

On the basis of accumulated evidence it seems fair to assume that the children of psychotic patients do not constitute a large or increasing element in the community, and that they would not represent a profitable special field for a mental health program.

THE MENTAL STATUS OF CHILDREN OF VARIOUS TYPES OF BIRTH

This study, in cooperation with the Johns Hopkins University Hospital, made steady progress during the fiscal year. Through the Baltimore Social Service Exchange it has been possible to secure such sociological data on the total group of approximately 5,000 cases as the agency was able to supply. The superintendent of the Baltimore public schools has made it possible to add to the study the school record of any child in attendance at the city schools.

DENTAL CARIES IN RELATION TO DIET AND CLIMATE

The fiscal year 1932 marked the completion of the field work on this study. Oral examinations of school children during this period increased the amount of material to be studied to more than 8,000 records. These data covered sections of South Dakota, Idaho, Arizona, Oklahoma, California, and New Mexico.

It is felt that the material in hand is representative of varying climatic conditions, and of different Indian tribal habits, and is sufficiently large in amount to have definite statistical significance. Through the cooperation of Dr. Leslie W. Foster, a field dentist of the Indian Service, 400 records were secured.

AGE AND SEX DIFFERENCES IN THE PREVALENCE OF DENTAL CARIES

Two statistical studies in these phases of dental caries were published during this fiscal year: Studies in Dental Caries No. 1. Prevalence of Dental Decay and Corrections Among School Children of Different Ages. (Public Health Reports, October 30, 1931.) Studies in Dental Caries No. 2. Sex Differences in the Prevalence of Dental Caries. (Public Health Reports, January 1, 1932.)

THE HEARING OF SCHOOL CHILDREN

An intensive study of the hearing of school children was begun early in the fiscal year. The importance of such a study is evident, because (1) there seems to be a rather high incidence of defective hearing in childhood; (2) the handicap of deafness may seriously interfere with material and intellectual advancement and individual happiness; (3) early discovery of the defect offers the best chance for improvement, adjustment, or training; and (4) a study of causal or related factors furnishes a basis for preventive measures.

Through the courtesy of the District of Columbia Board of Health and the Board of Education, it has been possible to undertake this investigation in the public schools of Washington.

It is planned to test the hearing of all children over 8 years of age with the phonograph No. 4–A audiometer. This is in the nature of a screening process, by which, roughly, the hard of hearing are separated from the normals. Every child showing a hearing loss in this test of nine or more sensation units is tested with the No. 2–A audiometer, an instrument of greater accuracy, which is helpful in determining not only the degree but the type of impairment. In addition, each child is given an examination of the ears, nose, and throat, and a history of past illnesses is obtained.

To evaluate properly the findings in this group of children, it was necessary to compare them with control material. For this purpose an approximately equal number of children with normal hearing were selected, having approximately the same age and sex distribution. These children are tested with the No. 2–A audiometer, given the ear, nose, and throat examination, and their history of past illness is recorded just as in the case of the group with defective hearing.

At the present time more than 4,500 children have been tested with the No. 4–A audiometer. Of this number, about 750 have been tested with the No. 2–A audiometer, and it is these children which comprise the study groups. It is planned to study not only the incidence of hearing defects but possible causative factors.

STUDIES IN VISION, PHYSICAL STATUS, GROWTH, AND DEVELOPMENT IN SCHOOL CHILDREN

Vision of school children.—Marked progress was made during the year in the tabulation of the data on the vision of school children. In cases where the eyes have been found to be different, the degree of visual defect in the two eyes was compared. The condition of the eyes found in the first examination was compared with those found in the second and in the third examinations. When a change had occurred, the amount of change was calculated and its direction indicated. Especial care was taken to study the length of time apparently necessary to bring about definite degrees of change.

Physical status, growth, and development of school children.—The statistical work on the physical status, growth, and development of school children, together with the seasonal morbidity among the group, progressed steadily in the first part of the fiscal year, but was later retarded through the resignation of the statistician in charge of this study.

COOPERATIVE WORK

During the fiscal year the Child Hygiene Office cooperated with the Girl Scouts of the District of Columbia, conducting physical examination of the girls who registered for attendance at the Girl Scouts camp.

MISCELLANEOUS

Health education in maternal and child hygiene through direct correspondence by the Child Hygiene Office was continued. The service extends to all parts of this country, with occasional extension to foreign countries.

Considerable data on the subject of maternal mortality were collected. These will form the nuclei for any study of this subject which the Public Health Service may be able to undertake.

Dental Studies

Dental Surg. H. Trendley Dean was assigned to duty in charge of dental studies September 12, 1931, with headquarters at the National Institute of Health.

Field investigations were begun in October, 1931, on the problem of the distribution of mottled enamel in the United States. Prior to this study, mottled enamel had been reported in the literature as occurring in areas which totaled 67 counties, scattered through 13 States. By means of a questionnaire survey, Doctor Dean added to this total 74 counties in 24 States, with 25 more counties in 9 States where its presence is as yet not fully determined. At present mottled enamel has been reported in the literature by dental societies or individual dentists or by survey in 24 States, and in 2 additional States it probably is present.

Surveys of mottled-enamel areas were conducted by Doctor Dean in Virginia, North Carolina, Kentucky, Illinois, Tennessee, and South Carolina.

Industrial Hygiene and Sanitation

The activities of this office have been carried out under the direction of Senior Surg. J. P. Leake.

DUST STUDIES

Health of workers in the dusty trades.—By means of X rays, physical examinations, and dust determinations, a study has been conducted in certain additional dusty trades (marble-stone finishing, slate quarrying and milling, talc mining and milling, granite-stone quarrying). Reports of the investigations of municipal and cotton dust were submitted for publication as public-health bulletins. Laboratory studies on the effect of dust on animals were continued.

Impinger apparatus.—A paper describing the design and construction of an apparatus for the sampling of atmospheric particular matter was published in the Public Health Reports for March 18, 1932. This device, known as the impinger apparatus, possesses the advantage of high dust-catching efficiency when sampling air over the full range of dustiness (from relatively pure outdoor air to that found in very dusty coal-mining operations) at the relatively rapid rate of 1 cubic foot per minute. The dust is caught in a liquid medium in which it may then be counted and analyzed microscopically, gravimetrically, and chemically. Three forms of the instruments were described, viz, the electrically driven, the compressed-air driven, and a hand-actuated form.

POLLUTION OF AIR AND ILLUMINATION STUDIES

Pollution of the air of cities.—This study is being made for the purpose of obtaining basic data on the condition of the air in the average American city as to the presence in the air of soot, ash, sulphur, lead, iron, and carbon monoxide. Its object is not to compare one city

with another, since such a comparison might lead to false conclusions, but rather to obtain a general picture of the conditions of air pollution as they exist at the present time throughout the whole country.

The study is being made in Washington, Baltimore, Philadelphia, New York, Boston, Buffalo, Cleveland, Detroit, Chicago, Pittsburgh, St. Louis, San Francisco, Los Angeles, and New Orleans. In 10 of these cities automatic instruments have been installed, which give a continuous record of the smokiness of the air.

It is planned to continue the field part of the study until sometime during 1933, in order that all seasons of the year may be adequately covered.

A paper on the "Solid Constituents of the Atmosphere of Possible Hygienic Significance" was read before the American Association for the Advancement of Science in December.

Loss of light due to smoke.—The study of the loss of light due to smoke in Baltimore, Md., has been completed and submitted for publication in the Public Health Reports. This study, covering a period of 12 months in the years 1929 and 1930, was made at the request of the committee on air pollution of the Baltimore Association of Commerce, with the cooperation of the city commissioner of health. The study showed a large relative loss of light due to smoke. In some cases the average hourly or daily loss was greater than 50 per cent. The average loss for the whole year was 13.2 per cent for clear days, 15.9 for cloudy days, and 14.1 for all days.

Ultra-violet and infra-red radiation.—An ultra-violet meter has been installed in Washington and continuous simultaneous records are being made with this instrument and the usual daylight recorder. Work is being done on the development of an infra-red recorder so that records of all three kinds of radiations can be made simultaneously.

METHANOL AGREEMENT

Methanol as an antifreeze and for other purposes.—Following recommendations from the conference of State and Territorial health officers, an agreement was reached with the various manufacturers of methanol (methyl alcohol, or wood alcohol) safeguarding its use as an antifreeze in radiators and for other purposes. As revised on June 2, 1932, this agreement provides that—

(*a*) Persons shall not sell or give away any substance containing more than 15 per cent of free methanol for use as antifreeze in automobile radiators unless it contains specified amounts of methyl violet, chloracetophenone, antimony-potassium tartrate, and additional stabilizer (to protect the color and the chloracetophenone), contains 20 per cent water by volume, and is in a container having prominently displayed a warning sign of specified nature.

(*b*) Persons shall not sell or give away any substance containing more than 15 per cent methanol for any purpose other than to prevent freezing in automobiles, unless the containers have prominently displayed a warning sign of specified nature.

(*c*) All sales shall be made with the understanding that the purchaser will carry out these provisions.

(*d*) There shall be no new extension of the use of methanol in industry until the conditions under which the substance can be used safely are scientifically established.

INDUSTRIAL DERMATOSIS

The investigation of industrial skin diseases was continued. The industries covered so far are as follows: Rubber (8,300 workers examined), dyeing of silk, wool, and fur (6,000 workers), oil refineries (4,500 workers), candy making (1,235 workers), and small numbers in certain other industries.

Candy making.—Among 1,235 workers kept under observation for a year there were 32 cases of skin conditions thought to be due to the occupation. The chief skin hazards in this industry, outside of burns from hot candy and sirup, are a dry, fissured, scaly condition of the hands due to sugar and dermatitis in individuals hypersensitive to the essential oils used as flavoring agents, particularly oil of cinnamon.

Oil refineries.—The chief skin hazards in this industry were burns of the skin from explosions and fires, and from acids and alkalies; the development on the hands of about 10 per cent of all workers of certain peculiar papillomata; the occurrence of oil acne and wax warts among the men working in the wax presses in those plants where paraffin is prepared, and an unusual prevalence of epithelioma.

Brazilian walnut.—A paper on a dermatitis associated with the use of Brazilian walnut wood was published in the Public Health Reports of August 14, 1931.

STUDIES OF SICKNESS AND PHYSICAL IMPAIRMENT

Pneumonia.—A report of the study of pneumonia among steel workers is being published as Public Health Bulletin No. 202. (See annual report for 1931, p. 50.)

Health of women in industry.—This study was continued, but no specific data have yet been obtained.

Frequency of sickness among industrial employees.—For the eleventh 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. These reports have been analyzed for each quarter year and for the year as a whole, and a mimeographed copy of the analysis was sent as soon as possible after the close of the quarter to each cooperating company and to industrial physicians and hygienists interested in the health of the industrially employed population. Among about 150,000 men included in this sample of the wage-earning population, the sickness incidence rate in 1931 was slightly higher than in 1930, but still somewhat below the average rate for the 10 preceding years. Respiratory diseases as a whole decreased from the 10-year average relatively more than did total sickness, and no year of record showed a lower rate of sickness exclusive of influenza than occurred in 1931. A similar result was found also in the first quarter of 1932, when comparisons were made with the corresponding period of each of several preceding years. The more detailed results are available in the articles presented quarterly in the Public Health Reports.

Survey of the work of employee mutual benefit associations.—A report of this survey, described in the last annual report, was published in the Public Health Reports for September 4, 1931 (Reprint No. 1506).

Physical impairments in specific occupations.—The report of this analysis was published in the Public Health Reports for January 1, 1932.

The physical examination as an instrument of research.—A paper on this general subject was published in the Public Health Reports for July 17, 1931 (Reprint No. 1492).

COOPERATIVE ACTIVITIES

Cooperation with the Bureau of Standards.—As in the previous year, an officer has been detailed to the Bureau of Standards for the purpose of cooperating in the care of injuries and for the laboratory investigation of health hazards in industry. Among such studies may be included osmium tetroxide and compounds used in dry cleaning.

Cooperation with industrial and other agencies, attendance at meetings, etc.—Members of the staff have represented the Public Health Service on various technical committees engaged in the preparation of specifications and codes relating to industrial-hygiene activities; for example, the medical officer in charge has served on an interdepartmental board as the result of which, it is believed, improvements will be made in sterilizers furnished to hospitals and other health units, and have given lectures on request of various organizations. Representatives of the section served on committees and subcommittees of the President's Conference on Home Building and Home Ownership.

Meningitis on shipboard.—The office cooperated with the Division of Foreign Quarantine in an investigation of outbreaks of epidemic cerebro-spinal meningitis on ships carrying steerage passengers between the Philippines and Hawaii.

Cooperation with the Bureau of Mines.—Surg. R. R. Sayers continued as chief of the health and safety branch of the Bureau of Mines and as chief surgeon of the health division, the medical personnel assisting him being detailed from the Public Health Service.

The work of the health division has included (1) a study of silicosis among the lead and zinc miners of the tri-State district of Kansas, Missouri, and Oklahoma; (2) the examination of substances to determine their suitability as refrigerants for local air conditioning in mines from the standpoint of nontoxicity or low toxicity, and nonflammability; and (3) an investigation of the amounts and effects of air pollution by automobile exhaust at busy corners in Pittsburgh, Pa., to serve as a basis for recommendations as to the length of time at different periods of the day that traffic officers can be on duty safely at the principal corners through the city.

MILK INVESTIGATIONS

The activities of this office were carried on under the direction of Sanitary Engineer Leslie C. Frank, with headquarters at Washington, D. C.

BACTERICIDAL TREATMENT OF CONTAINERS AND EQUIPMENT IN MILK PRODUCTION

The existing regulations of health departments with reference to the sterilization of milk utensils and equipment are based largely on residual agar plate counts. Since these do not necessarily measure the efficiency of sterilization with regard to pathogenic organisms, such regulations are not satisfactory from a public-health viewpoint.

The present studies were undertaken to remedy this deficiency. Two general methods were available for determining the efficiency of removal of pathogens: (1) By using the most heat-resistant and chlorine-resistant milk pathogen as a test organism, or (2) by using a nonpathogenic test organism of at least equal thermal and chlorine resistance. The latter method was selected. Sanitary Engineer A. W. Fuchs is working on this problem.

With the assistance of the New York City Health Department Research Laboratory, a *B. coli* strain was found which survived 140° F. for 30 minutes, and a substrain was finally found which usually survives 0.19 and sometimes as high as 0.27 p. p. m. of chlorine gas in water for 15 to 30 seconds, hence is more chlorine resistant than most of the pathogens tested by Tonney.

Since it would be necessary in all the laboratory and plant tests to work with known concentrations of test organisms, the next problem was the standardization of cultures. Several methods were experimented with, and the method adopted depends on preparing all agar slants from the same batch and all broth tube cultures from the same batch, and consists of inoculating a broth tube with a uniform loopful from a 24-hour agar slant culture, and incubating at 37° C. for 18 hours. As now used, a concentration of 500,000,000 to 1,000,000,000 organisms is obtained in the 18-hour broth culture.

Expermients were then conducted to determine the most suitable medium for rapid routine enumeration of the index organisms. It was concluded that where precautions could be taken to keep incidental contamination relatively low, agar plates were satisfactory.

To overcome the skip results inherent in the thermal and chlorine tests used by determining the last survivor, it is planned to determine the temperature or the chlorine concentration of different compounds necessary to produce a 99.99 per cent reduction of a standard concentration (over 300,000 per cubic centimeter) of the test organism in a standard period of time.

Objections to the precipitate test for determining the concentration of chlorine, as described in the Public Health Service milk code, have been raised by manufacturers of chloramine T compounds. To overcome these a series of tests has been begun, as part of the present studies, to determine the chlorine concentrations of different compounds determined by (*a*) the iodide-thiosulphate method, (*b*) the A. P. H. A. standard color method, and (*c*) the precipitate method.

Before the actual plant tests are begun, it is planned to conduct preliminary laboratory experiments to determine which of two proposed methods of recovering test organisms applied to surfaces is most satisfactory, and to standardize the variable factors involved in determining the efficiency of sterilization.

STUDIES OF THE PUBLIC HEALTH SIGNIFICANCE OF MILK COOLING

These studies are being conducted by Associate Milk Specialist F. A. Clark. The tentative conclusions thus far reached are as follows:

(*a*) That milk placed cold in a refrigerator kept at 50° F. or less will show less than twofold growth in 24 hours and less than tenfold growth in 48 hours.

(*b*) That milk in pint bottles placed warm (80 to 90° F.) in a refrigerator will show over eightfold growth in 24 hours, thirteenfold growth in 24 hours, and 750-fold growth in 48 hours if the refrigerator is kept at 60° F.

(*c*) That milk in quart bottles placed warm (80 to 90° F.) in a refrigerator will show over sixteenfold growth in 24 hours and over fortyfold growth in 48 hours if the ice box is kept at 46° F.; and over 210-fold growth in 24 hours and over 2,300-fold growth in 48 hours if the refrigerator is kept at 60° F.

It is believed that the results of these studies thus far completed indicate clearly the importance not only of keeping milk in a refrigerator but also the importance of receiving it cold and of placing it immediately in a refrigerator which is kept at a temperature of not less than 50° F.

CHLORINE DISINFECTION OF UDDERS AND HANDS COMPARED WITH SIMPLE CLEANSING

The objective of this problem being studied by Milk Specialist W. H. Haskell is the determination of the value of chlorine disinfection of udders and hands as compared with simple cleansing with water, and with soap and water cleansing.

Tentative findings.—The following tables give certain results thus far obtained:

Group	Number of specimens	Average plate count
1. Unwashed udders	122	5,112
2. Water washed udders	283	1,108
3. Chlorine washed udders (chlorine 50 to 100 p. p. m.)	280	116

Discussion of findings.—The results so far obtained indicate the following tentative conclusions:

(*a*) That the visible cleanliness of the udder is no indication of its bacteriological cleanliness.

(*b*) That proper washing with clean water and proper drying with clean cloths brought about a 78 per cent reduction in the surface bacteria on the udder.

(*c*) That washing the udder with a chlorine solution, between 50 and 100 p. p. m., brought about a 98 per cent reduction of the udder surface organisms.

The work on udders is being continued so as to secure a larger and more dependable number of observations, and future work will include studies of hand washing and chlorination.

RELATIVE VALUE OF THE DIRECT MICROSCOPIC COUNT, THE STANDARD PLATE COUNT, AND THE METHYLENE BLUE REDUCTASE TEST AS MEASURES OF MILK SANITATION

The objectives of this research project being studied by Asst. Milk Specialist R. C. Thomas, are—

(*a*) To determine which of the three tests is most responsive to variations in initial contamination; and (*b*) to determine which of the three tests is most responsive to variations in the length of time milk has been kept warm.

This work has not yet proceeded sufficiently far to justify a statement of conclusions.

EFFECT OF HEATING UPON THE GROWTH-PROMOTING CHARACTERISTICS OF COW'S MILK

Information upon the growth-promoting characteristics of cow's milk was secured from 39 municipalities located in 10 States, and embracing over 3,700 children 10 months to 6 years of age. A questionnaire was filled out for each child, giving information as to age, weight, height, kind of milk used in the diet, and duration of use for each kind, kind of supplementary food used in the diet, and duration of use for each kind, number of rooms and number of persons in the house, race, and incidence of diseases which might have been milk borne.

It is believed that a careful statistical study of the information secured justifies the conclusion that the growth-promoting capacity of heated milk plus the supplementary diet received by the average American child of 10 months to 6 years is not measurably less than the growth promoting capacity of raw milk plus the supplementary diet received by the average American child of 10 months to 6 years.

EXTENT OF PASTEURIZATION AND TUBERCULIN TESTING IN AMERICAN CITIES OF 10,000 POPULATION AND OVER IN 1927 AND 1931

The Public Health Service receives many inquiries from local health authorities and others regarding the extent of pasteurization and tuberculin testing in American cities, and it was therefore deemed advisable to bring up to date the data collected for the year 1927. Furthermore, such a review affords valuable measures of the rate of progress attained between 1927 and 1931 by these two important public health measures.

Therefore a questionnaire was sent during the summer of 1931 to the health officers of all cities of 10,000 population and over.

A study of the returns justified the following conclusions:

(*a*) The percentage of milk pasteurized in American cities of 10,000 or more population, increased from 81.8 per cent in 1927 to 87.5 per cent in 1931.

(*b*) The percentage of milk from tuberculin-tested cows in American cities of 10,000 or more population, increased from 68.1 per cent in 1927 to 88.0 per cent in 1931.

(*c*) The percentage of milk which was either pasteurized or from tested cows in American cities of 10,000 or more population increased from 99.1 per cent in 1927 to 99.83 per cent in 1931.

(*d*) The percentage of milk which was both pasteurized and from tuberculin-tested cows in American cities of 10,000 or more population increased from 50.8 per cent in 1927 to 74.5 per cent in 1931.

STUDIES OF THE INCIDENCE OF MILK-BORNE OUTBREAKS OF DISEASE

During the year 1931 the following outbreaks of milk-borne disease were reported to the Office of Milk Investigations by State and city health authorities: Typhoid fever 21, paratyphoid fever 1, scarlet fever 1, septic sore throat 8, diphtheria 1, dysentery 1, and gastro-enteritis 1.

APPOINTMENT OF THE PUBLIC HEALTH SERVICE ADVISORY MILK COMMITTEE

During the year it was decided to appoint a board of consultants in milk composed of the following members: Mr. H. A. Whittaker, Minnesota State Health Department, Mr. C. A. Abele, Alabama State

Health Department, Mr. E. S. Tisdale, West Virginia State Health Department, Mr. H. A. Kroeze, Mississippi State Health Department, Mr. V. M. Ehlers, Texas State Health Department, Dr. Paul B. Brooks, New York State Health Department, Mr. Loomis Burrell, Dairy and Ice Cream Machinery and Supplies Association (Inc.), Dr. D. B. Peck, International Association of Milk Dealers, Mr. Seth W. Shoemaker, Certified Milk Producers Association of America, Mr. Ernest Kelly, United States Department of Agriculture, and Mr. Leslie C. Frank, United States Public Health Service.

This Public Health Service Advisory Milk Committee is to study all proposed amendments to the Public Health Service milk ordinance or code and to advise the Public Health Service regarding them.

The first meeting of the committee was on May 16, 1932, and a number of proposed amendments were considered and passed upon.

PUBLICATIONS

During the year the following publications were prepared:

The Temperature Behavior of Milk Pasteurizer of the Thirty Minute Holding Type. By L. C. Frank and F. J. Moss. Twentieth Annual Report International Association of Dairy and Milk Inspectors, 1931.

Do Children Who Drink Raw Milk Thrive Better than Children Who Drink Heated Milk? By L. C. Frank, F. J. Moss, W. H. Haskell, F. A. Clark, M. M. Miller, and R. C. Thomas. Conference of State and Territorial Health Authorities, June 6, 1932.

The Extent of Pasteurization and Tuberculin Testing in American Cities of 10,000 Population and Over in 1927 and 1931. By L. C. Frank and F. J. Moss. Mimeographed publication.

The Public Health Service Milk Sanitation Program. By L. C. Frank. Mimeographed publication.

Importance of a National Unified Milk Sanitation Program. By F. A. Clark. Texas Public Health Association, 1931.

Studies of Public Health Methods

The office of studies of public health methods has continued under the direction of Surg. Joseph W. Mountin. Its purpose is to determine the value of various public health procedures and to devise ways and means for more effective and economical application of information concerning the prevention of disease and the promotion of health.

Two methods of approach are used: (1) A detailed analysis of selected operations in the programs of health agencies; and (2) the more comprehensive survey of local health problems and community services.

A study conforming to the first definition is being conducted in Brunswick and Greensville Counties, Va. The initial phase of this study is designed so as to determine the health needs of people living in rural areas and the manner in which an average small county health department is meeting these problems. A separate but closely related study is being made of the work of the health department personnel from the administrative point of view. One nurse and two field canvassers have been engaged in the work since August, 1931. Passed Asst. Surg. J. O. Dean was placed in immediate charge of the Virginia study during the month of February, 1932. The field canvassers have visited 1,005 families comprising a representative sample of the population. A comprehensive schedule has been completed on each family covering such points as social and economic

circumstances, sanitary conditions, sickness experiences during the preceding 12 months, medical services, contact with different members of the health department, and various public health measures which were put into effect.

A job analysis is being made of the work of the county health officer, the county nurses, and the county sanitary officer. The plan of study is essentially the same for the workers in the three classes. The data being assembled will show (1) the amount of time devoted to the several operations; (2) the source of calls; (3) the problems found on each visit; (4) the service rendered; and (5) the result which came as a consequence of the visit. The group of community activities of the health department are being subjected to the same type of analysis as is the individual case work. Prior to beginning the study proper it was necessary to make observations on the content of the local program and the method of approach in order to set up a study and a system of records which would bring out the points enumerated above. It is planned to continue the study so as to cover a full year of operation for each worker.

Surveys of the health services in Wilkes-Barre, Pa., and Baltimore, Md., in progress at the close of the last fiscal year, were completed and recommendations were made to the local authorities. A similar service was rendered to the city of Seattle, Wash. The public health organizations in the States of Mississippi and Alabama were studied for the Brookings Institution as a part of their general survey of the State governments.

A special report on rural health and housing was prepared for the President's Conference on Home Building and Home Ownership. Assistance was rendered to the Committee on Rural Health Practice of the American Public Health Association in connection with the development of the appraisal form for rural health service. In cooperation with the American Public Health Association and other national health agencies, a study is being made of the requirements of health departments with regard to records and reports. This information is being used as a basis in formulating definitions for those activities which are common to most health departments and in developing uniform methods for recording and reporting these activities.

Statistical Investigations

The office of statistical investigations continued under the direction of Senior Statistician Selwyn D. Collins, with Principal Statistician Edgar Sydenstricker and Consultants W. H. Frost and Lowell J. Reed in close touch with all important phases of the work.

STUDY OF THE INCIDENCE AND COST OF ILLNESS

A considerable part of the year was spent on the tabulation of a mass of data on the incidence and cost of illness in about 9,000 families in 17 States and the District of Columbia. These data were collected by the Committee on the Costs of Medical Care and made available to the Public Health Service through a cooperative arrangement. The data to be used and published by the Public Health Service relate to incidence and the type of care which the patient received; items relating to cost are to be used by the Committee on the Costs of Medical Care.

An incidence of 850 illnesses per 1,000 population per year was recorded. In some instances these illnesses consisted of two more or less distinct diagnostic entities occurring simultaneously, such as measles and whooping cough, and if these entities be counted separately, there is a total of 889 cases per 1,000 persons. These rates approximate those found for Hagerstown some 10 years ago of 1 case per person per year. Of the cases serious enough to cause the patient to go to bed for one or more days, there were 461 per 1,000 persons per year, or 52 per cent; and of those that caused the patient to lose time from his usual work or school, there were 545 per 1,000 persons per year, or 61 per cent.

Facts about the care received for these illnesses are of interest. Seventy-nine per cent of the cases had the care of a physician or some other practitioner, such as an osteopath or a chiropractor—75 per cent had the care of a physician with only 4 per cent attended by these other practitioners without a physician on the case. Eleven per cent of all the cases were reported as having a specialist on the case, and this must be considered a minimum statement, inasmuch as some physicians who are specializing on certain types of cases were not so reported by the family. Eight per cent of all the cases were treated in a hospital for one or more days. This is in striking contrast to the 1.3 per cent of the Hagerstown cases that were treated in a hospital, but the present group includes a great many families from large cities where the facilities for hospitalization are much better than in Hagerstown. Forty-one per cent of the deliveries were made in hospitals as compared to 3 per cent in the Hagerstown study. Of the total cases of illness, 8 per cent were surgical. Surgery, as used in this study, included both major operations and such minor operations as the lancing of a boil or the removal of a wart. A careful record was also kept of bone surgery in the case of fractures, etc., and it is believed that the record of surgery is reasonably complete. The 2,607 surgical cases represent a rate of 6.8 surgical cases per 1,000 population. Of the total surgical cases, 60 per cent were in a hospital, and of the total hospital cases 61 per cent were surgical.

Data on the place of treatment were also included in the study. Thirty-seven per cent of the total cases had one or more home calls by a physician or other practitioner; 8 per cent were treated in a hospital; 34 per cent were treated at the office or clinic without any home calls or hospital care, and 21 per cent had no physician or other practitioner in attendance. It is surprising to find that of the total cases of illness only about 4 per cent had any treatment at a public clinic.

FIELD STUDIES OF MORBIDITY

The study of sickness in a distinctly rural area of Cattaraugus County was continued throughout this fiscal year. The area studied is strictly rural, the largest village having a population of less than 1,000 persons and the other villages being unincorporated clusters of houses with populations of 50 to 200. The study was undertaken to find the extent and causes of illness among farm families and other rural dwellers. For comparative purposes a shorter study covering a period of one year was made in an industrial city, Syracuse, N. Y. In both studies the method was the periodic canvassing of a group of

about 1,500 families to keep a continuous complete record of illness and medical care during the period of the study.

These studies of morbidity in a rural and urban area have been conducted on a cooperative basis with the Milbank Memorial Fund. It is expected to make a study of diphtheria carriers in this rural area. The diphtheria case and death rates have declined during the past 10 years to a very low level, but there is no evidence that the number of diphtheria carriers has declined to any considerable extent. The diphtheria carrier is, therefore, becoming increasingly important in the spread of diphtheria. A rather extensive study of diphtheria carriers was made in Baltimore by the Johns Hopkins School of Hygiene some years ago, but there are no data on the prevalence and distribution of diphtheria carriers in the rural part of the country.

INFLUENZA STUDIES

The studies of influenza were continued throughout this fiscal year. A paper on the 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, was published in the Public Health Reports for August 14, 1931, and two other papers on influenza and other respiratory diseases are in proof. One further paper on the 1928–29 epidemic is practically completed and it is expected that it will be published during the coming fiscal year. The studies of influenza during the 1928–29 epidemic indicate an entirely different age distribution of cases and deaths from the 1918–19 epidemic. The most outstanding thing about the great pandemic of 1918–19 was the very high peak of pneumonia cases and deaths among young adults. The 1928–29 epidemic did not show any such peak. This young adult peak in the 1918–19 epidemic was higher for males than for females, but the 1928–29 mortality and the pneumonia incidence were practically identical for the two sexes at the young adult ages. With the exception of the 1920 epidemic, none of the five or six influenza epidemics that have occurred since 1918 have shown any large excess mortality among young adults.

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 mortality report for the year 1931 with provisional rates by cause of death and by State was published in May of 1932. This report indicated that, in spite of the unfavorable economic conditions, the year 1931 had been one of low mortality—in fact, the death rate from all causes of 10.9 per 1,000 population in 18 States was lower than in any preceding year. The death rates from typhoid fever, tuberculosis, and diarrhea and enteritis likewise continued their steady decline. These preliminary reports with data about a year ahead of the final reports have been found to be very useful.

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.

COOPERATION WITH OTHER OFFICES AND DIVISIONS OF THE SERVICE

A considerable part of the work of the Office of Statistical Investigations consists of the rendering of assistance to other offices and divisions of the service.

Stream Pollution

Field headquarters of Stream Pollution Investigations have been maintained at Cincinnati, Ohio, under the direction of Sanitary Engineer J. K. Hoskins. As a guide to the formulation and development of the general policies to be pursued, a special board of consultants frequently reviews progress and advises with the scientific personnel.

Particular attention has been devoted to the rounding out of experimental evidence and the summation, in permanent form, of the more important conclusions developed from research studies in water purification and natural stream purification upon which the station has been engaged during recent years. With the advancement of this program, and in accordance with the advice of the consultants, it has appeared advisable to give increased consideration to the third of the three major phases of stream pollution, that of sewage treatment. In furtherance of this plan, an experimental activated sludge treatment plant is being constructed on the station grounds, which it is intended will furnish a continuing supply of material for research study of certain of the biochemical and biological factors operative in this method of sewage purification.

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

The extensive data collected during the resurvey of the Ohio River made in 1929–1931 have been critically analyzed and summarized in a monograph prepared for publication as a Public Health Bulletin by Sanitary Engineer H. R. Crohurst, who has been in immediate charge of this study.

By suitable arrangement of these data it has been possible to make some interesting comparisons of the sanitary conditions observed during the two surveys. In general, during the winter periods of unobstructed flow, the bacterial pollution was somewhat higher in 1930–31 than that observed in 1914–1916, although the organic pollution as measured by the oxygen demand was considerably less. In the summer periods, when the stream is a virtual series of pools, this retardation of flow has the apparent effect of intensifying the conditions of pollution in the immediate vicinity of the sewage discharge and, by increasing the time of flow, improving the water at places farther downstream. While these decreased bacterial loads at waterworks intakes make the production of a bacterially satisfactory effluent less difficult, the effects of decreased turbidity and increased volumes of microscopic organisms, resulting in shortened filter runs and possible taste and odor production, more than offset the good effects of lower bacterial content. The concentration of decomposition products due to fermentation of organic deposits within the pools, when the dams are in continuous operation, may have public-health aspects not heretofore appreciated. Reference is made to the suspected water-borne outbreak of gastroenteritis along the Ohio River at the time of and following the low-water conditions in the fall and winter of 1930–31. Canalization, at least between Cincinnati and Louisville, has had a

tendency to complicate, rather than simplify, the problems connected with sewage disposal, nuisance production, the operation of water treatment devices, and the preservation of the public health.

STUDY OF STREAM OXIDATION

A statistical and experimental study of stream oxidation phenomena has been undertaken by Sanitary Engineer H. W. Streeter, with the purpose of elucidating the fundamental principles governing the processes of natural oxidation in polluted streams and the extent to which these processes are modified by various physical and biological conditions. The present study is, in effect, an extension of that of the Ohio River (Public Health Bulletin 146), made possible by more comprehensive data and additional experience concerning the effects of certain factors, notably those of sludge deposits and biological growths in the channel, on the progressive rate of recovery of streams subject to a depletion of their natural oxygen supply by polluting wastes.

Basic data for a study of this kind are now quite extensive, having been accumulated over a period of several years past from laboratory surveys of the Ohio, Illinois, and upper Mississippi Rivers by the Public Health Service, and from similar surveys of other streams by various State and local sanitary authorities.

Supplementing the field data above noted, an extensive series of controlled experimental observations has been instituted in the artificial stream channel located at this station in which the rates of reaeration and oxidation in a flowing stream of polluted water may be measured under varying conditions of depth, velocity, and turbulence. It is planned to measure also the rates of deoxygenation in a sewage-polluted stream of river water flowing through the channel, both in the absence and in the presence of sewage-sludge deposits of various depths, and to determine the influence of attached biological growths and the effects of the more common forms of algae known to liberate oxygen in water through their photosynthetic action. Observations of this kind, on a quantitative basis, are possible only under experimental conditions such as are afforded by a controlled artificial stream.

The analysis of field data, though still only in its preliminary stages, has indicated quite definitely that the process of progressive deoxygenation in sewage-polluted streams is governed very largely by three main factors: (1) The biochemical oxygen demand of the suspended oxidizable matter present in the supernatant water; (2) the rate of formation and liberation of directly oxidizable decomposition products resulting from bacterial action in sludge deposits; and (3) the rates at which both these products and those of similar nature resulting from septic conditions in the wastes discharged into streams are oxidized directly in the flowing stream. An effort is being made to develop a general method for evaluating these factors by means of the usual laboratory tests as applied to the stream water.

EXPERIMENTAL STUDIES OF NATURAL PURIFICATION IN POLLUTED WATER

The activities of biological life in the oxidation of organic matter in water are not only of fundamental importance in the processes of natural stream purification, but underlie the biological methods of

sewage treatment as well. For this reason, increasing attention has been devoted to the phases of the problem directly related to sewage purification.

Activity of algae in pure culture.—The study of organisms in pure culture has been concerned chiefly with the functions of unicellular algae of the kinds usually prevalent in natural water. Excluding atmospheric aeration, it was demonstrated that, in dilute liquid media, following inoculation with *B. aerogenes* only, the dissolved oxygen gradually diminished to depletion, whereas in companion cultures which contained both *B. aerogenes* and a minute green alga, the latter organism produced sufficient oxygen by photosynthesis to prevent such exhaustion and to restore gradually the content of oxygen present at the start. Bacterial growth meantime was practically identical in the two sets of cultures. The quantity of algal growth required to produce such results did not exceed the amount frequently found under natural conditions. Further similar work is in progress, designed to determine any essential differences in results when atmospheric aeration is available to these same organisms.

Nitrification studies.—An essential difference between the biological systems of sewage treatment and the so-called mechanical or electrolytic processes is that the purification of the sewage by microorganisms may be carried out to the point of securing complete nitrification of the nitrogenous materials. A study of the nitrification process was, therefore, undertaken to supplement the existing meager information regarding this phenomenon, particular attention being paid to the effect of variations in the pH value of the medium on the rate and extent of nitrification. Valuable information has also been obtained in regard to the amount of oxygen which disappears in the course of the nitrification of sewage matter so that the possibility now exists of making a fair estimate of the residual oxygen requirements of a partly nitrified effluent on the basis of readily determined constituents.

The catalysis of biological oxidations.—It is well established that the air oxidation of numerous forms of organic matter in solution may readily be accomplished if the pH value of the medium is suitably raised. In practice the cost of purifying sewage by such a procedure would be prohibitive, although the effect in question is easily demonstrated on a laboratory scale. Considerable interest has therefore been evinced in the claims of several experimenters to the effect that, in the presence of certain catalytic agents, the oxidation of organic matters could be made to proceed at ordinary pH values without the addition of lime or similar reagents. A repetition of these experiments under carefully controlled conditions has failed to support the claim for the catalytic activity of the ferropyrophosphates at ordinary pH values, wherever bacteria are rigidly excluded from the solutions. Neither does it appear that bacterial activity is greatly stimulated by the presence of the supposed catalytic agents.

Bulking of activated sludge.—A preliminary study of the phenomenon of "bulking" in the activated sludge process of sewage treatment has led to the conclusion that special methods of sewage analysis, now unavailable, would have to be developed before this source of difficulty in plant operation could be successfully differentiated from other possible causes of poor performance. In one plant studied, however, it was determined that bulking occurred where the filaments of the fungus *Sphaerotilus* attached to the floc particles exceeded a total

length of about 10 feet per cubic millimeter of the solid matter constituting this floc. Under normal operation conditions, these filaments did not exceed about 4 feet per cubic millimeter. It was further observed that, when bulking was in progress or about to occur, the distribution of the fungus growth became general, affecting the large majority of the floc particles.

Development of methods.—In the course of research studies it frequently becomes necessary to devise methods or to modify existing technique for application to the particular problem in hand. During the past year, modifications of the usual Winkler method were proposed [1] for the more accurate determination of dissolved oxygen in water containing certain forms of organic matter, hypochlorites, and sulphite wastes. Comparative studies of various types of dilution waters for bacterial examinations indicated a wide divergence in results attributable to this factor. A suitable, easily reproducible water for the purpose was recommended.[2]

MISCELLANEOUS ACTIVITIES

In addition to the research activities in which the station is engaged, requests have been complied with for technical advice and assistance from States, municipalities, and organizations confronted with special problems in water sanitation. Another important activity has been service on committees of technical organizations interested in many phases of stream improvement, water supply, sewage treatment, and the standardization of competent analytical procedures.

Cooperation with interstate watershed boards.—During the year assistance has been rendered to the Ohio River and Great Lakes Drainage Basin Boards in the formulation of suitable analytical procedures for stream examinations. Further aid is being rendered the Ohio River board of State engineers in the systematic collection and interpretation of data pertaining to the sanitary quality of the water of the river in connection with their comprehensive program for the protection of the raw-water supplies of Ohio River cities.

Coeur d'Alene River and Lake lead-pollution study.—The Coeur d'Alene River in Idaho is seriously polluted by the waste slimes discharged by the lead-mining industry in that area. Assistance is being rendered to a special State legislative commission appointed to study the problem.

Instruction in stream-examination procedures.—A 2-weeks' school of instruction in methods and interpretation of data of stream-pollution examination has been given to a class of scientific employees of State health departments for the fourth successive year. One representative from each of 21 States, selected by the Conference of State Sanitary Engineers, was in attendance. This method of instruction aids individual States to inaugurate and carry forward studies of their stream-sanitation problems with some assurance that the procedures they employ are in general use and well adapted for the purpose.

NATIONAL INSTITUTE OF HEALTH

The administration of the National Institute of Health for the fiscal year 1932 continued under the supervision of Director George W. McCoy and Assistant Director R. E. Dyer.

[1] Ind. & Eng., Chem. Analytical Edition, vol. 4, pp. 59-64 (Jan. 15, 1932).
[2] Journal of Bacteriology, vol. 23, pp. 355-368 (May, 1932).

Library.—During the fiscal year 1932 the library continued under the immediate supervision of Miss Carrie Myers. There is a total of 15,570 volumes now on the shelves. Many annual reports and other publications from State and municipal health departments were received. Numerous publications issued by scientific institutions throughout the world were added to the collections.

DIVISION OF PATHOLOGY AND BACTERIOLOGY

STUDIES OF NUTRITIONAL DISEASES

Studies on nutritional diseases at the institute were continued under the direction of Surg. G. A. Wheeler, assisted by Passed Asst. Surg. W. H. Sebrell.

The laboratory studies were carried out on dogs and correlated with those in man, and were concerned with the determination of the probable pellagra-preventive value of individual foodstuffs.

In collaboration with the Division of Chemistry, studies were made on methods for quantitative estimation of the antipellagra vitamin.

Typhus-Rocky Mountain spotted fever.—The investigations of typhus-Rocky Mountain spotted fever were continued during the fiscal year under the direction of Surg. R. E. Dyer. Associated in the investigations throughout the year were Passed Asst. Surg. A. Rumreich and L. F. Badger. During the first half of the year Asst. Surg. E. T. Ceder was one of the group, being replaced during the second half by Asst. Surg. W. G. Workman.

Following the discovery, in 1931, that rat fleas, taken on premises where cases of endemic typhus were occurring, contained the virus of the disease, studies were carried out in the laboratory to determine the behavior of the virus in the flea and the exact mechanism of transmission from rat to rat.

It was found that two species of rat fleas, *Xenopsylla cheopis* and *Ceratophyllus fasciatus*, became infected with typhus when fed on typhus-infected rats. As the incidence of human cases of endemic typhus corresponds more closely to the prevalence of *Xenopsylla cheopis* than to that of *Ceratophyllus fasciatus*, the former flea was made the subject of intensive study.

It was found that the virus of endemic typhus could survive in this flea (*Xenopsylla cheopis*) as long as 52 days, this being the limit of the experiment. It is thought possible that fleas once infected may remain infected through life.

The virus was found to undergo a definite multiplication in the flea. For the first three days after an infective feeding, it required the amount of virus present in more than one-half of a flea to infect a guinea pig. After three days, one thirty-second of a flea contained an infective dose for a guinea pig. Later titrations showed that the virus present in $\frac{1}{128000}$ of an infected flea was sufficient to infect.

Under experimental conditions endemic typhus is readily transmitted from rat to rat by means of fleas when the fleas are allowed free access to the rat. Efforts to transmit typhus by feeding infected fleas on white rats and guinea pigs through chiffon were without result. In these experiments the chiffon apparently kept the flea feces from intimate contact with the skin. The feces of infected fleas were found to contain the virus, and when this material was rubbed into the abraded skin of guinea pigs, the disease was trans-

mitted. From the foregoing it seems that a possible method of transmission of endemic typhus by the rat flea is through the scratching or rubbing of infected flea feces into the skin.

Late in the fiscal year it was found that a vaccine, prepared by treating an emulsion of typhus-infected fleas with phenol (0.4 per cent) conferred some immunity upon guinea pigs.

Studies on the epidemiology of Rocky Mountain spotted fever (eastern type) were continued throughout the year. It was found that the disease was present in Maryland, Virginia, District of Columbia, New Jersey, Delaware, Pennsylvania, North Carolina, South Carolina, Georgia, Louisiana, Minnesota, and possibly Tennessee. Efforts were made to determine the presence of spotted fever in wild rodents and ticks obtained from their normal habitats. These attempts were without success. However, in prosecuting this work an infection was recovered (its probable source being stock guinea pigs) which in some ways simulated Rocky Mountain spotted fever in laboratory animals. This infection was determined to be due to a new type of *Salmonella enteritidis*. This particular phase of the work serves to stress the importance of the following criteria in the diagnosis of spotted fever in laboratory animals: Typical clinical course in guinea pigs, production of a positive Weil-Felix reaction in rabbits or monkeys, negative blood cultures when taken at the height of the infection in guinea pigs; the presence of characteristic brain lesions in guinea pigs; and cross-immunity tests with known strains of spotted fever virus.

Microbic variation.—Because of its possible influence on the epidemiology of communicable diseases, the question of whether or not bacteria undergo a complicated life cycle in which they show marked changes in morphology and behavior is of great concern to workers in the field of public health bacteriology. During the past year Surg. R. R. Spencer has been engaged in the study of the possible life cycle of *B. proteus* X_{19} and of the *Streptococcus scarlatinae* with the purpose of developing, if possible, a simple technique for the production of bacterial variants at will and which, at the same time, would be as free as possible from the chance of contamination. The possibility of such contaminations has been the chief criticism of previous work in this important field. Although such a technique has not been perfected to date, the organisms mentioned above have at various times been placed in plain broth containing some single more or less harmful substance (fuller's earth, charcoal, garden soil, sea sand, rattle-snake venom, carnotite ore, and killed masses of various bacteria), and the cultures studied at intervals for the presence of variants or mutants. Suggestive but irregular results were obtained; but by submitting the bacteria to the effect of the gamma rays of radium, very profound changes in morphology and cultural characteristics have been observed. Further work is necessary before any definite description of these changes can be made.

Undulant fever.—Field investigations of undulant fever have been continued by Senior Surg. H. E. Hasseltine.

Reports from various State departments of health show that 1,572 cases were officially reported during the year. These cases occurred in 44 States and the District of Columbia.

144391—32——5

Prolonged observation of undulant fever infection at a State sanatorium for tuberculosis has revealed that several patients in whom evidence of active tuberculosis was meager, or wanting, have shown a positive agglutination reaction against *Brucella* antigens in relatively high titer. This indicates that undulant fever may be mistaken for early tuberculosis and should warn physicians that an agglutination test for undulant fever should be made in all persons in whom the presence of tuberculosis is suspected but not confirmed by the usual methods of diagnosis.

Previous reports as to the methods of transmission of the disease have been confirmed by the investigations of the past year, during which special attention was given to the question of transmission from person to person or by "carriers." No evidence of transmission in this manner has been found.

The effectiveness of pasteurization in preventing the transmission of undulant fever by dairy products continues to be shown by the low incidence of the disease in cities that have a considerable portion of their milk supply pasteurized.

Psittacosis.—Senior Surg. H. E. Hasseltine has made field investigations of outbreaks of this disease. In October, 1931, psittacosis appeared in New York City and the infection was traced to shell parrakeets obtained from a bird dealer in San Francisco. In two instances in New York the infection was transmitted to other birds (parrots) that were temporarily housed in the same pet shop with the San Francisco parrakeets. In both instances the parrots, which had been in the possession of the owners for a long period, carried the infection to the families when the birds were returned home from the pet shop.

Early in December, 1931, an outbreak of psittacosis occurred in California. Investigations revealed a total of 43 cases with 9 deaths. While there was some evidence that the infection was brought in from the Orient, there was also evidence that some human cases were attributable to California-bred parrakeets. Subsequent investigations have revealed that the disease is present in the parrakeet breeding aviaries of southern California. The control or eradication of this infection from these establishments presents a difficult problem.

In California the shell parrakeet seems to be the great reservoir of infection, though two cases were traceable to infection in canary birds. It also appears that shell parrakeets may transmit the infection without showing evidence of illness. Evidence was also obtained that the disease is occasionally transmitted from person to person, particularly from patient to nurse. In the majority of cases where person-to-person transmission has occurred, the primary case has resulted fatally.

Relapsing fever.—The work on relapsing fever has been carried on by Medical Director Edward Francis. Hereditary transmission of relapsing fever from naturally infected adult ticks (*Ornithodorus turicata*, collected in Texas) through their eggs to their progeny was demonstrated. This shows the practical impossibility of eradicating this tick reservoir of infection. Probably 50 cases of relapsing fever have been observed in Texas in the last few years and 10 cases were reported from California in 1931.

Poliomyelitis.—Studies by Surgs. W. T. Harrison and Charles Armstrong have been carried out experimentally in monkeys to de-

termine the effect of nonspecific immunity upon later poliomyelitis infection, with results that suggest some modifications of the virus infection. Surgeon Harrison has carried out field studies relating to the effect of vaccination against smallpox, and of immunization against diphtheria, on the incidence of poliomyelitis in two urban areas but without conclusive results.

Trachoma.—Most of the active work on trachoma was suspended at the laboratory in Rolla, Mo., and certain phases were transferred to Washington, where the studies have been continued by Senior Bacteriologist Ida A. Bengtson. Efforts have been continued to transmit the disease to *Macacus rhesus* monkeys by direct transfer from active cases of trachoma, with the idea of comparing the lesions thus produced with those induced by inoculation of *Bacterium granulosis.* It has been found very difficult to transmit the disease to monkeys by either method. When once induced by the inoculation of cultures of *Bacterium granulosis,* lesions are easily transmissible, only one swabbing being necessary to transfer the infection. Thus far the lesions produced by direct transfer of secretions from the conjunctival sac of trachoma patients to the eyes of monkeys have been found to be less pronounced and less easily transmissible than are the lesions produced by inoculation of cultures of *Bacterium granulosis.*

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

The State of New Hampshire was added in January, 1932, to the area of distribution, leaving only the three States of Maine, Vermont, and Connecticut in which the infection has not been found. Sweden recognized her first case of tularaemia in March, 1931.

Tests upon artificially infected rabbits have shown the persistence of virulence of *Bacterium tularense* in rabbits stored for five months at 3° C. and in those stored for one year at −15° C., thus demonstrating the possible danger to health of cold-storage wild rabbits.

Antistreptococcus bacteriophage.—Studies by Senior Bacteriologist Alice C. Evans have been carried out to determine what substances in the body inhibit the action of bacteriophage. Complete inhibition of the phage activity was found when in contact with blood serum, purulent exudate, ascitic fluid, or bile.

Plague.—Continuance of the observations by Medical Director Francis have shown that plague cultures on plain agar stored nine years at 10° C., but without transfer to fresh culture medium during that time, grew promptly when transferred to fresh culture medium and were fully virulent for guinea pigs and white rats. Plague guinea pig spleens suspended in pure undiluted glycerin at −15° C. for seven years harbored fully virulent *B. pestis* at the end of that time.

Pathology.—Work in the section of pathology has been carried on by Passed Asst. Surg. R. D. Lillie, aided by Asst. Surg. J. G. Pasternack. The histologic diagnostic service to marine hospitals and other agencies has been continued; 1,743 specimens from these sources were examined and reports submitted.

In addition to this diagnostic work, specimens from 947 experimental animals, representing 6,056 blocks, were subjected to histologic examination and reports were made. The subjects covered in this material were toxicologic histology of poisonings by orthocresyl phosphate and phosphite, by copper salts, by osmic acid vapor, by

carbon tetrachloride vapor and by arsphenamines; the diagnosis of psittacosis in birds detained at United States quarantine stations; studies in the pathologic histology of psittacosis in birds (in press), studies on typhus and Rocky Mountain spotted fever in guinea pigs, rabbits, and monkeys, on poliomyelitis in monkeys, on vaccinia in mice, rabbits and guinea pigs, on experimental malignant and benign tumors, and attempts at production of malignant tumors by inoculation with a certain microorganism regarded by some workers as the cause of cancer, on experimental meningococcus meningitis in rabbits and guinea pigs, on rabbit syphilis and guinea pig tuberculosis, on pseudotuberculosis in guinea pigs, on coccidiosis in rabbits, on experimental heart disease, on blacktongue of dogs, on plague in guinea pigs, on tularaemia in guinea pigs and other animals, on the reaction to the toxins of *Vibrion septique* and of *B. diptheriae* in rabbits, guinea pigs, and monkeys, on experimental trachoma in monkeys, and on various intercurrent morbid conditions in experimental animals.

Experiments on mounting media for thiazene dyes have been carried out, and a further prolonged trial of the most satisfactory of these on routine histologic material is being initiated. Experiments on the control of eosin polychrome methylene blue staining have been carried out, and a technique has been arrived at which is now under extended routine trial.

A study on the gross and minute pathology of the eastern type of Rocky Mountain spotted fever in man was completed and published in the Public Health Reports for November 27, 1931, and a similar study on human psittacosis is nearing completion.

There follows a tabulation of the specimens examined during the fiscal year:

	Surgical	Autopsy	Total
A. Tissue specimens of human origin:			
Hospitals and relief stations	1,154	214	1,368
Prisons and other Federal agencies	246	35	281
In cooperation with State and local health agencies	26	0	26
Field investigations of the service	17	19	36
Miscellaneous	30	2	32
Total human	1,473	270	1,743
B. Pathology of experimental diseases			947
C. Prepared for other divisions, but not examined in section on pathology			47
Total histopathology			2,737
D. Specimens routinely examined or tested:			
Blood and spinal fluid for Wassermann and Kahn test			15,730
Blood—			
Count			16
Tularaemia			589
Undulant fever			793
Typhus fever			1,803
Typhoid fever, para A and para B			205
Urinalyses			89
Cultures:			
Diphtheria			148
Miscellaneous			87
Sputum			2
Brain for rabies, animal			13
Feces			29
Smears			6
Catgut			16
Gauze			2
Water			52
Total miscellaneous			19,580

SPECIAL STUDIES ON PROPHYLACTIC AND THERAPEUTIC AGENTS

Scarlet fever.—Studies having to do with the control of biologic products derived from the hemolytic streptococcus of scarlet fever origin have been continued by Surg. M. V. Veldee, with the assistance of Passed Asst. Surg. G. L. Dunnahoo.

A clinical study of the therapeutic value of scarlet fever antitoxin, begun last year, has been completed and the report published in the Public Health Reports for December 18, 1931. The antitoxin-treated patients developed 75 per cent fewer complications than did the control group, which received no serum. However, 66 per cent of the serum-treated patients developed serum sickness of varying degree.

A study of the immunizing quality of streptococcus toxoid is being made, with over 700 toxin-susceptible persons under observation. These persons received either two or three immunizing doses spaced at three or four week intervals. Retests one month following the last dose showed 80 to 90 per cent with negative skin tests. Retests will be repeated at intervals to determine the durability of the immunity.

A study of the use of the ear of the white rabbit for standardizing scarlet fever biologic products has been completed and the results have been published in the Public Health Reports for May 6, 1932. This is a neutralization test similar to the present standard human-skin test method. The new method gives results that may be compared with those obtained by the older method.

A new study was undertaken late in the fiscal year on the biologic action of exotoxins derived from strains of hemolytic streptococci other than those of scarlet fever origin.

Post vaccination complications.—Studies by Surg. Charles Armstrong have resulted in the collection of data concerning 83 proved or probable cases of encephalitis after smallpox vaccination for the United States during the past 11 years, 66 of which number occurred during 1928, 1929, 1930, and 1931.

Attempts to produce the pathological picture of the human disease in experimental animals have continued to give negative results. Field studies have been continued and show that cases have not been confined to any particular strains of vaccine virus or to any special vaccination methods.

The relative rarity of postvaccination encephalitis following vaccinations performed during the first year of life and following secondary vaccinations, as noted for Europe, is apparently true also for the United States. Since the vaccination reactions in both these relatively insusceptible groups tend to be less severe than do primary vaccinations performed after the first year of age, an attempt has been made to modify primary vaccinations in an effort to simulate this milder type of reaction. It was found that when a sufficient amount of diphtheria toxin was incorporated with vaccine virus to produce a positive Schick reaction at the vaccination site in rabbits, the local "take" was largely inhibited and the general response was less severe.

It was next shown that groups of mice previously inoculated with two doses (0.5 cubic centimeter) of diphtheria toxoid, when subsequently given carefully titrated doses of vaccine virus intracerebrally, withstood the vaccine inoculations better than did control groups.

Based on these experimental results and owing to the fact that in the United States diphtheria offers a far greater hazard of death for children than has smallpox during recent years, it has been suggested that children be immunized against diphtheria and then vaccinated against smallpox about one month after their last injection. It is deemed that the preliminary exercise or mobilization of the defense mechanism makes for a more efficient antivaccinal response on the part of the vaccinated individual.

Occasional cases of postvaccinal tetanus continue to develop, but, in so far as information has been secured, are entirely confined to dressing-covered "takes."

Studies have been begun looking toward a possible elucidation of the circumstances under which the occasional cases of postvaccinal septic infections are occurring.

Meningitis.—Studies on meningitis were continued by Senior Bacteriologist Sara E. Branham. One hundred and twenty new strains of meningococci were received and studied during the year, making a total of 492 strains which have been studied intensively in respect to their cultural characteristics and their serological interrelationships. A discussion of this phase of the work, and of the conclusions drawn from it, is embodied in a paper entitled "Serological Diversity Among Meningococci" now in press.

Investigation during the past year has followed two principal lines:

1. A study of some of the newer methods proposed for evaluating antimeningococcic serum was undertaken. Junior Bacteriologist Anna M. Pabst was associated in this phase of the work.

Special attention was given to the technique proposed by Shwartzman, involving the neutralization of a skin reaction produced by injecting filtered meningococcus washings intravenouly into locally sensitized rabbits. A high percentage of samples of antimeningococcic serum, obtained from manufacturers, neutralized this reaction, but the usefulness of the technique in standardizing serums seems to be limited.

2. Attempts to produce meningococcus infection in laboratory animals.

Experiments with rabbits showed that both a clinical and histopathological meningitis can be produced by intracisternal injection of large doses of virulent meningococci. It was necessary that the culture be used for this purpose immediately after isolation, and it was not possible to maintain its virulence in culture or by animal passage. This phase of the work is still in progress.

Gas gangrene antitoxin.—The work of establishing standards for the various antitoxins contained in gas gangrene antitoxin has been conducted by Senior Bacteriologist Ida A. Bengtson. The unit for measuring the potency of *Vibrion septique* antitoxin has been under consideration and a quantity of *Vibrion septique* serum of high potency to be used as standard has been dried and a supply of dried *Vibrion septique* toxin prepared. Tests in rabbits indicate that those animals are suitable for testing purposes, though work on the suitability of other species is in progress. A comparison with the standards of other countries is being made with a view to establishing an international standard.

Diphtheria toxin-antitoxin mixture.—An attempt was made by Surg. W. T. Harrison to explain by laboratory methods a very evi-

dent spontaneous increase in toxicity of the 0.1 L + dose of certain toxin-antitoxin mixtures. This increase in toxicity apparently was not due to freezing. The results of the experimental work are not conclusive.

Arsphenamines.—Studies by Asst. Pharmacologist T. F. Probey on the therapeutic activity of neoarsphenamines in experimental syphilis in rabbits have been continued. Previously reported observations that the trypanocidal activity in rats does not parallel the spirocheticidal activity in rabbits are confirmed.

In the treatment of 156 cases of all stages of human syphilis, two products of different trypanocidal activity were quite uniform in their ability to influence the reacting substances in syphilitic sera.

DIVISION OF ZOOLOGY

Prof. C. W. Stiles, who served as chief of this division since it was founded, retired from active duty in October, 1931, since which time the work has been under the supervision of Junior Nematologist Mabelle O. Nolan.

Bulletins.—National Institute of Health Bulletin 159, on the parasitic diseases of insectivores in relation to the diseases of man, has been issued from the press.

A bulletin on the parasitic diseases of carnivores in relation to the diseases of man has been completed.

An additional bulletin on the parasitic diseases of pinnipedia is practically finished.

Examination of parasites for diagnosis.—This part of the routine work of the division has been continued throughout the year, and 160 specimens have been examined for various Government hospitals, State health departments and universities, and for practicing physicians. In addition, over 6,000 ectoparasites have been determined.

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.

DIVISION OF PHARMACOLOGY

The following work has been pursued by the division of pharmacology under the direction of Pharmacologist Director Carl Voegtlin:

CANCER RESEARCH

As in the two preceding years, the work on cancer has been based on the assumption that cancer is not an infectious disease in the strict sense, but rather a chemical abnormality of living cells. Therefore, it would seem that the discovery of new facts concerning the chemistry of normal and cancer cells in the body should gradually lead to a better understanding of the nature of this disease and should ultimately serve as a foundation for a rational chemical treatment. The discovery of an effective treatment of cancer by chemicals is obviously a very difficult problem; but success along this line, even if partial, would be a great step forward in the control of the disease. The

present methods of treatment—surgery and radiation—are confined essentially to the removal or destruction of tumors which are still more or less restricted to their point of origin. On the other hand, the introduction of suitable chemicals into the body might act destructively upon malignant cells irrespective of their location in the body.

The available knowledge concerning the chemistry of cells is still rudimentary. Very little information is available which could give an adequate picture of the chemical processes concerned in the multiplication of body cells and the chemical factors which either favor or inhibit cell division. And yet it is obvious that the uncontrolled multiplication of malignant cells is one of the principal characteristics of cancer. Nor is there much known about the hydrogen-ion concentration (acidity) of normal and cancer tissue, a factor which is generally accepted as an important controlling influence in the life of all living cells. Furthermore, little knowledge exists concerning the building up of the specific cellular proteins which form such an important part of protoplasm and which presumably determine to a considerable degree the characteristics which differentiate different types of cells from one another. Therefore, it was along these lines that the various phases of the investigation were conducted.

(*a*) *The hydrogen-ion concentration of normal and malignant tissues in the living animal.*—The new method for the study of this problem, which was referred to in the 1931 annual report, was applied to a systematic study of the acidity of cancerous and normal tissues. In view of the great variation in tumors, malignant as well as benign, it was essential to study as many different types as could be obtained. The following were used: Eight standard transplanted malignant tumors of the rat, benign tumors of the rat, a carcinoma of the rabbit, and a spontaneous mammary carcinoma of the mouse. These different tumor strains were obtained through the kindness of Drs. Burton T. Simpson, G. B. Walker, and Francis C. Wood. The results so far obtained indicate that all the malignant tumors studied are acid, probably due to the lactic acid formed in such tissue (Warburg). The benign tumors were neutral or slightly alkaline in reaction. The normal tissues immediately surrounding the malignant tumors appear to be more acid than the same tissue located at a distance from the tumor. The normal tissues so far studied are alkaline. These estimations may be of value in explaining the destructive action of malignant tumors on the surrounding normal tissue, for it is possible that the increased acidity on the junction between malignant and normal tissue may be injurious to the latter, either directly due to an action of the acid on the normal cells, or through a disturbing influence on the enzyme mechanism of the normal cells. These acidity estimations are also useful for the study of malignant tissue outside the body, when it is desired to study these tissues at the same acidity as that within the body.

(*b*) *Influence of the oxygen tension on the proteolysis of tumors and normal tissues.*—The important work of Warburg and coworkers has emphasized the lactic acid fermentation of sugar as the main source of energy for malignant tissue. The protein metabolism of cancerous tissues has received but scant attention, and yet it would seem that the growth of malignant tumors must involve the building up (synthesis) of proteins within the tumor cells. The protein metabolism

was therefore studied outside the body under conditions approximating those within the body. It was found that the oxygen tension (under constant pH) is a controlling factor in proteolysis. A low oxygen tension favors and a high tension inhibits proteolysis.

Definite evidence was also obtained showing that protein synthesis occurs if the split products of a tumor autolysate are exposed to a high oxygen tension. Similar evidence of a reversal of autolysis (protein synthesis) under the influence of oxygen was also obtained in the case of skeletal muscle. Further work is needed to ascertain whether this fundamental observation applies to tissues in general. The interesting aspect of these findings is that they do throw some light on the way in which body cells build up their proteins. It would seem that the oxygen tension of the tissues may play a deciding regulating influence on this process. Under physiological conditions the oxygen supply to the tissues is carefully regulated by physiological means, whereas in cancer tissue it would seem that the physiological mechanism fails. Further analysis of the oxygen effect on proteolysis has shown that oxygen operates through the organic sulphur system (glutathione and protein sulphydryl groups) of the tissues. For this phase of the work, suitable methods were devised for the estimation of reduced and oxidized glutathione and protein sulphydryl. These methods were also applied to the estimation of the glutathione content of various types of tumors and normal tissues. A striking difference was found between benign and malignant tumors, the former containing a very low percentage of reduced and oxidized glutathione. It may be recalled that previous work of the division has shown that glutathione has a pronounced favorable action on cell division (*Amoeba proteus*).

(*c*) *Tissue cultures.*—Work has been continued on the chemical control of the medium used for tissue cultures. Previous research by the division had provided a satisfactory method for controlling the hydrogen-ion concentration and carbon dioxide tension. A satisfactory method has now been worked out for controlling the oxygen tension also. These methods have been applied to the cultivation of mammary epithelium, both normal and malignant. While it is feasible to grow certain malignant epithelial tumors for prolonged periods, it has not yet been possible to maintain continuously normal mammary epithelium in culture. This object is highly desirable for a comparison of the behavior of malignant mammary epithelium with its corresponding normal tissue. The successful cultivation of normal epithelium would also furnish an opportunity to attempt the transformation of normal into malignant cells *in vitro*.

(*d*) *Chemistry of cell division.*—Progress has been made in the study of the action of various chemicals of physiological interest on cell division of *Amoeba proteus* under chemically controlled conditions. It has been found that very low concentrations of glutathione increase the rate of nuclear growth and increase the percentage of nuclear division. This is accompanied, under the experimental conditions employed, by a decrease in cytoplasmic volume. In last year's report it was stated that minute amounts of copper exert an inhibiting influence on cell division. It has now been found that the copper action is associated with a marked decrease in the growth of the cell nucleus. Similar experiments on the action of iron, manganese, and cobalt have shown that these metals do not possess in equivalent

concentrations the inhibiting action shown by copper. However, lead inhibits cell division in very low concentrations, a fact which is of interest in connection with the claims made for the lead treatment of cancer. Clinical evidence concerning the value of this treatment shows that while it may be of benefit to some patients, it is, in its present form, undoubtedly too dangerous for general use on account of the liability of lead poisoning. It is hoped that the study of heavy metals and other compounds will ultimately furnish systematic knowledge as to their function in the chemistry of cell division, not only in *Amoeba* but also in other types of cells.

In order to promote the chemical studies on the *Amoeba*, a careful study has been made of the morphology and certain physiological aspects of the division process in *Amoeba proteus*. It was found that division normally is mitotic and by binary fission. The time relations of the various stages of cell division and the accompanying structural changes have been established in great detail. This knowledge will permit the study of the action of chemicals on cells ready to divide and possibly also on the various stages of division. Information thus obtained may lead to the discovery of chemical agents which, while relatively nontoxic, may inhibit specifically the division of cells.

(*e*) *Chemotherapy.*—The action of certain chemicals on the growth of malignant tumors of the rat has been under investigation. Various types of copper compounds were studied. Some of these appear to have a slight inhibiting action on tumor growth, but the effect is not sufficiently pronounced to be of therapeutic significance. However, efforts along this line will be continued as further basic knowledge as to the action of heavy metals on cell chemistry accumulates.

It may not be amiss to point out that the plan of cancer research followed by the division, apart from its direct bearing on cancer, has yielded by-products which are of more general biochemical interest.

The cancer studies being conducted at the Harvard Medical School will be found reported on pages 22–26.

PHARMACOLOGY OF PHENOL ESTERS

In 1930–31 it was demonstrated that the curious type of multiple neuritis, or the so-called ginger paralysis, was due to the hitherto unknown effect of the phosphoric ester of orthocresol in the human body. In view of the fact that rather closely related chemical compounds, such as phenyl salicylate, guaiacol carbonate and phosphate, and creosote carbonate and phosphate, have been in use in therapeutics, it became a matter of practical as well as of theoretical importance to investigate the manner of action of the paralyzing ester in the animal body. This investigation was conducted along two main directions: First, the general pharmacologic behavior of a number of chemically related compounds was studied in the hope of discovering some underlying principle governing the relation of chemical constitution and physiologic action peculiar for this group of compounds; and, second, the fate of the paralyzing ester in the animal body was studied in the belief that differences in distribution, fixation, and detoxification of this ester as compared with chemically related esters will ultimately account for its specific action.

With this plan in mind, 12 phenol esters were studied during the past year. These included organic esters, phosphoric esters, thiophosphoric esters, and phosphorous acid esters of the better known

phenols. Of all the esters so examined, only the thiophosphoric ester and the phosphorous acid ester of orthocresol have been found to share to any extent in the specific action of triorthocresyl phosphate. Moreover, the phosphorous acid ester of orthocresol has been found to produce in the experimental animal a condition of extensor rigidity in many ways analogous to decerebrate rigidity, this being associated with combined degeneration of the nervous system with more or less specific involvement of certain well defined afferent and efferent tracts.

The studies on the fate of some of these esters in the animal body have disclosed certain relationships between the rate of hydrolysis of these compounds *in vitro*, their stability and hydrolysis *in vivo*, and their pharmacologic action in the animal organism.

VITAMIN B STUDIES

Since the demonstration of the dual nature of vitamin B in 1926, there has been no satisfactory method of effectively separating the complex into its two recognized components B_1 and B_2 other than the destruction of B_1 by heating of the complex for several hours at 120° C., which procedure leaves B_2 largely unimpaired. The separation of B_1 and B_2 by chemical procedure requires satisfactory methods of assay of the two vitamins. Work was done during the past year towards developing a quick and reliable method of assay of B_2 and some observations have been made on the differential solubility in certain organic solvents of B_1 and B_2 as they occur in dried brewers' yeast.

PHARMACOLOGY OF THE ARSPHENAMINES

Several years ago work carried out in this division led to the theory that the chemotherapeutic action of the arsphenamines is due to the conversion of these drugs within the body of the host into compounds of the arsenoxide type, which latter can be considered as the active parasiticidal and toxic agents. During the fiscal year under report confirmatory evidence of the essential correctness of this theory has been procured by means of a color test which differentiates between the arsphenamines and their oxides. The color test consists in a chemical reaction between arsenoxide and 1,2 naphthoquinone, 4, sodium sulphonate. This test has been applied (*a*) to the oxidation of arsphenamine, neoarsphenamine, and sulpharsphenamine by molecular oxygen in the test tube, and (*b*) to the demonstration of the formation of arsenoxides in the tissues of the living animal. It was found that in test tube experiments oxidation of the arsphenamines proceeds within the physiological pH range with the formation of arsenoxide. Similarly, evidence was obtained of the formation of arsenoxide in the liver of the living animal. It is interesting that, in confirmation of previous evidence indicating a definite latent period in the chemotherapeutic action of the arsphenamines, a similar latent period following the injection of the drugs was also necessary to demonstrate the presence of arsenoxide in the tissue.

The new color test for arsenoxide appears to be of value for testing the quality of commercial arsphenamine and its deterioration on long continued storage.

ACTION OF HEAVY METALS ON SULPHYDRYL CONTAINING PROTEINS AND ON CYSTEIN

In view of the biological importance of sulphydryl compounds, a study was made of the heavy metal catalysts which are concerned in

the oxidation of certain SH-containing proteins and cystein. It has been shown that copper salts added to cystein solutions cause an oxidative breakdown of the molecule with the production of carbon dioxide, ammonia, and sulphuric acid. Salts of iron or manganese under similar conditions oxidize cystein to cystin. This is the first evidence of a more or less complete oxidation of an amino acid by a metallic catalyst in the absence of solid agents with large surfaces (charcoal). The oxidation of sulphydryl-containing proteins (coagulated egg albumin) is also favored by copper salts and carbon dioxide is produced. Manganese is less effective than copper and iron; cobalt, tin, or zinc are practically inert. The addition of iron or copper salts to dialyzed tissues brings about an oxygen consumption which is largely concerned with the oxidation of fats.

These observations are of interest as regards the function of heavy metals as biochemical catalysts.

MISCELLANEOUS

The chief of the division has continued to serve as a member of the committee on drug addiction of the National Research Council. Expert pharmacological advice and assistance were given to other departments of the Federal Government and private organizations. The chief of the division visited several cancer laboratories in Europe and in this country for the purpose of discussing various problems concerning cancer research with investigators interested in this field.

DIVISION OF CHEMISTRY

The work of the division of chemistry was continued under the direction of Prof. Claude S. Hudson.

SUGAR RESEARCHES

A large number of sugar compounds were prepared and studied during the fiscal year.

A method has been developed for the decomposition of acid phenylhydrazides by oxidation with copper sulphate which has the advantage of rapidity and obviates many troublesome operations of the older method. It has been employed successfully in the preparation of such compounds as mannonic acid lactone, α-galaheptonic lactone, and β-galaheptonic lactone sirups from the corresponding phenylhydrazides in yields of better than 80 per cent of theory.

A method has also been developed for the rearrangement of acetylated glycosides to form the α-acetates of the sugar. By this method, glucose-α-penta-acetate has been prepared from tetra-acetyl-β-methyl glucoside and α-hexa-acetate of β-galaheptose from penta-acetyl-β-methyl-β-galaheptoside.

Improvements were effected in the preparation of anhydrous β-1-rhamnose, β-tetra-acetyl-1-rhamnose, in the separation of the phenylhydrazides of α- and β-galaheptonic acids and in the method of isolating fucose from the seaweed *Ascophyllum nodosum*.

The reaction of trityl chloride with β-methyl-d-xyloside in pyridine solution was studied and two isomeric di-trityl-β-methyl-d-xylosides were isolated. The isloation of the latter shows that trityl chloride reacts with the secondary hydroxyl groups in β-methyl-d-xyloside and that the views prevailing in the literature that it reacts only with

primary hydroxyl groups are incorrect. This conclusion was further confirmed by a study of α-methyl-fucoside which contains only secondary hydroxyls. For this purpose, a comparatively large quantity of crystalline fucose was prepared. The pure α-methyl-fucoside finally obtained, was found to condense readily with triphenyl methyl chloride, thus proving the nonspecificity of the latter toward primary hydroxyl groups.

It was proved experimentally that anhydrous β-l-rhamnose and β-tetra-acetyl-l-rhamnose have the same ring, thus confirming the prediction regarding these compounds as based on rotatory data.

ENZYM RESEARCHES

The general object of these researches is to devise new methods, or to improve old ones, for the purification of active principles of biochemical origin. The specific problem, during this fiscal year, has been to separate the invertase of yeast. An improved procedure has been worked out for concentrating the invertase of yeast to such an extent that in the best preparation obtained, up to the present, the ratio of invertase to total solid was about 450 times more favorable than in the original yeast. Although a greater concentration of the invertase has been effected by other methods, the procedure used in the present investigation has the advantage that it avoids the need of the lengthy process of dialysis or of electrodialysis required by the other methods.

ANALYTICAL WORK

About 159 various analyses of miscellaneous material and 11 mineral analyses of waters were carried out. In addition, there were examined about 34 arsenicals and several toxicological examinations were made on body fluids and miscellaneous material. In connection with this work, there was a continuation of the analytical work required in the studies of the relation of diet to pellagra. Analyses were made of the salts used, the required standard acids were prepared, and chemical examinations were carried out on some of the foodstuffs used.

COOPERATIVE WORK

The cooperative work of the division in the studies of the relation of diet to pellagra was continued by supplying necessary material for the development of a suitable biological method of testing the activity of various concentrates. There was also a continuation of the cooperation with the Division of Pharmacology in the studies of so-called ginger paralysis and assistance was rendered in connection with the problem of the distribution of triorthocresyl phosphate in the animal organism. Assistance was rendered in connection with the investigation of mottled enamel.

There were analyzed 202 samples of atmospheric dust from 14 different cities in the United States, in connection with an investigation conducted by the office of industrial hygiene and sanitation.

FELLOWSHIP

Under the terms of the gift of the Chemical Foundation (Inc.), to the National Institute of Health for the establishment of a research

fellowship in chemistry, Dr. Clifford B. Purves was appointed as research associate effective September 1, 1931, and has since been engaged in enzym researches.

CONTROL OF SERUMS, VACCINES, AND ANALOGOUS PRODUCTS

Control of the manufacture and interstate sale of biologic products, in accordance with the law of July 1, 1902, continued under the supervision of the Director of the National Institute of Health. The testing was carried out by Laboratory Assistant B. T. Sockrider and Assistant Pharmacologist T. F. Probey. The usual inspections of establishments in the United States and Canada were made and, in addition, European establishments holding or applying for license were inspected. At the end of the fiscal year 46 licenses were outstanding, 10 of which were held by foreign producers. The licenses cover 141 different preparations.

The following is a tabular statement of samples of products received and tested during the year. In many instances individual samples were subjected to repeated tests:

Serums, vaccines, toxins, etc.:	
Tested for sterility	1,809
Tested for potency	780
	2,589
Arsphenamines:	
Tested for toxicity	216
Tested for solubility and stability	338
	554
Total	3,143

MISCELLANEOUS

Clinical research in marine hospitals.—Advantage is being taken of the excellent possibilities for clinical research in the marine hospitals; and through cooperation with the division of marine hospitals and relief, studies are being conducted in these hospitals where the available clinical material is suitable for the special subject of study. The clinical facilities for research in the marine hospitals will be a most valuable aid to laboratory research.

The second meeting of the National Advisory Health Council was held May 20 and 21, 1932. There were nine members of the council in attendance at this meeting. The work of the various divisions of the Public Health Service was reviewed and the recommendations of the council were secured as to the continuation and expansion of the work along present lines and the development of new studies.

During the fiscal year there have been 6 public health bulletins, 3 National Institute of Health bulletins, and 161 scientific articles for the Public Health Reports or for outside publication submitted to this division for review and recommendation as to publication.

DIVISION OF DOMESTIC (INTERSTATE) QUARANTINE

In charge of Asst. Surg. Gen. C. E. Waller

Plague-Suppressive Measures in California

The work in plague-suppressive measures in California has been pursued along the same lines as in recent years, as it has been demonstrated that the most satisfactory results are accomplished by this procedure. No human case of plague was reported, but rodent plague was reported in ground squirrels in San Benito County, and a recrudescence of plague in rats occurred in the City of Los Angeles.

PLAGUE IN GROUND SQUIRRELS

Although plague was demonstrated by shooting operations in only one county during the year, it is not believed that this indicates freedom from infection in other counties in which plague was found among ground squirrels during the preceding two or three years.

The work has been pursued in accordance with the definite program followed in recent years, and the infestation of the counties specified is materially less than it was a few years ago. A zone practically free from ground squirrels has been secured in the counties around the port of San Francisco and East Bay communities.

The operations in other counties by the county horticultural commissioners, in cooperation with the State board of rodent control, particularly in areas found infected with plague, have been prosecuted with more vigor during the past three years than previously and much more effective work is now being performed in the control of these rodents.

Too great emphasis can not be placed on the necessity of continuous operations in the control of ground squirrels; and if practically squirrel-free areas have been created by continuous operations, it is necessary that the work be continued on a lesser scale in order to maintain such results.

The heaviest infestation of ground squirrels is on land devoted to grazing that has not yet come under cultivation. Difficulty has been experienced in successfully prosecuting extensive operations over these large areas and, although gratifying results have been accomplished and a diminution in rodents has been effected, at the same time such areas have not yet reached a satisfactory condition for the control of plague in these rodents.

The field operations carried out by the Public Health Service are shown in the following tabulated statement:

Number of inspections	1,291
Number of reinspections	4,244
Number of acres inspected	271,396
Number of acres reinspected	1,015,794
Number of acres treated	373,133

MEASURES TAKEN AGAINST RATS

Similar operations have been pursued as in preceding years. These are embraced under the following activities: (*a*) Trapping and examination of rats, (*b*) inspection of premises where rat infestation has been 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 the public health. The work was carried on in San Francisco and Oakland.

Rat survey in Los Angeles.—Although the Public Health Service has taken no part in the rat survey which has been carried on in Los Angeles, the officer in charge of plague-suppressive measures has kept in touch with it. Through this survey rodent plague was found in the spring of this year in rats around three old foci of infection. Confirmation of plague in rodents reported by the Los Angeles Health Department has been made in the Public Health Service laboratory in San Francisco. In accordance with suggestions made in a cooperative spirit, energetic measures have been taken by the city health department of Los Angeles to eliminate these foci of infection.

Sanitary inspections in San Francisco.—This work, carried out in cooperation with the San Francisco Department of Health, is directly related to measures instituted for plague-suppressive operations. Rat-infested premises are inspected and those in insanitary condition are examined and reported to the department of health for action. The work accomplished is shown by the following tabulation:

Rat complaints investigated	1,115
Insanitary premises inspected	153
Number of buildings submitted to department of health for condemnation	38
Number of buildings acted on by department of health and condemned	31
Number of buildings acted on by department of health and not condemned	7
Number of buildings abated following condemnation proceedings: By repair, 1; by demolition, 28	[1] 29
Number of buildings condemned and remaining unabated	20

PUBLIC HEALTH SERVICE PLAGUE LABORATORY

The plague laboratory has been continued in rented quarters during the year, and although the building is old, the operations have been satisfactorily performed. A new laboratory building is now in process of erection on the marine hospital reservation. This laboratory will be thoroughly equipped for all the activities required of service stations, and will constitute a research center for diseases and public health problems.

During the year examination was made of 28,761 rats trapped in San Francisco, and 2,904 from Oakland. Examination was also made of all rats recovered on vessels after fumigation. This is of importance as some of the rats are on vessels coming from ports suspected of being infected with plague. No plague infection has been found among the rats examined, although a few cases of rat leprosy and some suffering from hemorrhagic septicemia have been noted.

The laboratory operations performed during the year are shown in the accompanying summaries:

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

Summary of laboratory operations

	Received	Examined
Examination of rodents for plague:		
Rats from San Francisco	35,448	28,761
Rats from Oakland	3,019	2,904
Rats from fumigated ships	687	687
Wassermann reactions		5,871
Bacteriological examinations (culture and microscopic):		
Water		567
Other		335

Trachoma Prevention Work

The trachoma problem in this country is not in our large cities or our seaports; it is in the rural sections of the Appalachian Mountains in Kentucky; the highlands of central and eastern Tennessee; in the rural portions of what is known as the Ozark uplift, which comprises nearly all of southern Missouri, a large share of Arkansas; and in southern Illinois. From the Ozark uplift the disease has penetrated very definitely into Oklahoma and to some extent into northern Texas.

Trachoma presents a public health problem chiefly because it produces blindness and damage to vision. The tendency to blindness seems to differ in various sections of the United States. This point was brought out in a short published report entitled "Trachoma Virulence in Different Areas of the United States" which appeared in Public Health Reports May 20, 1932.

Treatment must always remain an important element in any trachoma-prevention campaign. Each case is a focus of infection and must have treatment in order that the spread to others may be prevented. Therapy and education in personal hygiene together make the ideal combination.

It is said that trachoma never becomes epidemic. There are sections, always rural, where many individuals suffer or have suffered with the disease. Families can be found where every member has trachoma, with one or two members blind or partly blind from the disease. Evidence so far indicates that trachoma is communicable. However, it certainly does not have a high degree of communicability. Apparently long intimate contact is necessary to contract trachoma. The spread seems to occur chiefly within families. Exposure in schools apparently is responsible for but very little spread.

During the year trachoma eradication activities were carried on by the Public Health Service in cooperation with the State health authorities in Missouri, Kentucky, Tennessee, Georgia, Oklahoma, and Texas.

Missouri.—Field work was carried on intensively during the year through the activities of a full-time field nurse furnished by the State board of health and the physician in charge of the trachoma hospital at Rolla. Treatment clinics were held at regular intervals over a period of time in four different areas of the State. The number of days of hospital relief at Rolla increased slightly over that for the preceding year. The average stay in the hospital was reduced by one day. The per capita cost of hospitalizing patients at Rolla was

$2.09 per day. The use of diathermy in treating trachoma at this hospital so far shows no superiorty over older methods. Material from fresh untreated cases of trachoma was furnished to trachoma research workers of the National Institute of Health in Washington, and the Washington University Medical School at St. Louis, Mo.

Kentucky.—Field work in this State was conducted throughout the year. Several county health units in the trachoma territory were aided in establishing trachoma treatment clinics which were conducted by the respective health officers. The health officers were brought to the hospital at Richmond and trained intensively for several days before undertaking these clinics.

The hospital at Richmond made very good use of its beds during the year, with a resulting high bed capacity efficiency record. The number of days of hospital relief increased as compared with the preceding year.

Three different research groups were furnished trachomatous material from the lids of fresh untreated cases during the year.

Tennessee.—Work did not start in this State until October, 1931. An attempt is being made in this field to bring the work as near the homes of afflicted people as possible, most of the therapy being done in regular clinics held at stores, schools, courthouses, etc. A few beds are available for the more severe and complicated cases. A few counties are being worked intensively, one at a time. An average of 11 treatment clinics have been held weekly.

Georgia.—Trachoma in this field is so mild that very little hospitalization is necessary. Damage to vision is seen only at infrequent intervals. During the year several treatment clinics were maintained in southwest Georgia. In September, 1931, a state-wide survey for trachoma was started. Some trachoma was found in several counties in southern Georgia, but it was confined largely to a group of nine counties in the southwestern part of the State. Along the northern border of the State a more severe type of the disease was found, but fortunately it is not widespread.

Oklahoma.—During May and June a short intensive trachoma program was intiated in the northwestern part of Oklahoma in cooperation with the State board of health. Many severe cases of the disease were found, and a temporary hospital was maintained at Picher, Okla., for about one month, supported partly by a mine operators' association and partly by the State board of health. Many cases seen had extensive damage to vision. It is interesting to note that the majority of these trachoma sufferers in this part of Oklahoma were born in Missouri or Arkansas, and all are native whites.

Texas.—In the spring of 1932 a trachoma field nurse spent some time in central east Texas in the counties of Polk, Angelina, Trinity, and Walker. Several schools were surveyed in each county, but only a few cases of suspected trachoma were found. This inspection included the only tribe of Indians in Texas. It was interesting to note that these Indians showed very little pathology resembling trachoma.

RESEARCH

The cause of trachoma still remains undetermined. The Public Health Service, through its several cooperative trachoma units, during the past year has actively aided trachoma research workers of

the National Institute of Health, Washington University Medical School, and the medical department of Chicago University. Research in therapy, the influence of diet and cod-liver oil on the course of the disease, and the public health aspects of trachoma has been carried on by the workers in trachoma-prevention activities of the Public Health Service.

Field work

Field clinics:	
Number of clinics held	621
Number of persons examined	15,649
Trachoma cases seen (old trachoma)	4,346
New trachoma cases seen	1,598
Suspicious cases seen	817
Treatments given at clinics	3,928
Field nurse activities:	
Public talks given	659
People (estimated) in audiences	41,048
Homes visited	3,896
People examined in homes	7,161
Suspicious cases in homes	979
Number pupils examined in schools	62,305
Suspicious cases in schools	3,486
Number treatment clinics, nurse only	477
Number treatments by nurse	19,869

Dispensary and hospital relief, operations, etc.

Dispensary relief:	
Number examined	6,488
Old cases, trachoma	3,689
New cases, trachoma	631
Total attendance	6,488
Average daily attendance of all stations	3.4
Combined dispensary and field clinic data: Total number of new individual trachoma cases discovered	2,234
Hospital relief:	
Hospital capacity	112
Cases admitted during the year (total)	762
Number cases first admission	515
Days relief furnished	25,404
Operations: Total number of operations	1,115

Supervision of Water Supplies Used by Common Carriers

The cooperative plan between the State health departments and the Public Health Service for certification of water supplies used for drinking and culinary purposes on interstate carriers continued in operation. Certain changes tending toward decentralization, bringing the district offices in more intimate contact with the work, brought about a considerable increase in the number of inspections and certifications as shown in the accompanying tables.

During the year sources of drinking water used on airplane carriers engaged in interstate traffic were added to sources requiring certification, and a majority of these new sources were inspected and reported upon.

During the past two years there has been a tendency toward requiring more rigid compliance with that section of the Treasury Department Standards covering undesirable features that might introduce potential dangers. This has brought about a considerable increase in the number of supplies receiving provisional certification pending correction of undesirable features. That the water supplies selected by the carriers are generally of good quality is shown by the fact that

it was necessary to prohibit the use of only 2.8 per cent of such supplies.

During the year assistance was rendered to the States in making inspections of 178 water supplies used by interstate carriers and in preparing 4,327 certificates of examination.

The inspection of a source of water supply by the State officials has generally stopped with the delivery of the water to the property of the carrier, the matter of proper handling of the water by the carrier being left to the Public Health Service. Two States, Illinois and Texas, have included in their inspections the handling of the water by the carrier and base their recommendations as to certification on the water as delivered to the passenger rather than to the carrier. The following comparative tabulation of the percentages of completed certifications indicates the status of this work and shows the increase in its completeness:

	Per cent of completed certifications				
	1927	1928	1929	1930	1931
Railroad supplies	80	82	81	87.5	92.75
Vessel supplies	75	78	78	88.0	95.87
Airplane supplies					85.83

INTERSTATE CARRIER WATER SUPPLIES

The following tables covering the calendar year 1931 show the status of this work by States:

Railroad supplies for calendar year 1931

State	Source classification				Certification status				Per cent sources acted upon
	Public [1]	Private [2]	Railroad	Total	Satisfactory	Prohibited	Provisional	Action pending	
Alabama	44	1	1	46	46	0	0	0	100
Arizona	12	2	8	22	17	0	4	1	95
Arkansas	56	2	3	61	39	11	11	0	100
California	46	6	20	72	45	1	26	0	100
Colorado	25	2	6	33	25	0	8	0	100
Connecticut	13	0	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	2	10	55	54	0	1	0	100
Georgia	52	1	1	54	41	5	8	0	100
Idaho	17	1	9	27	25	1	0	1	96
Illinois	78	3	13	94	74	0	20	0	[3] 100
Indiana	45	0	7	52	8	1	42	1	98
Iowa	60	1	10	71	35	3	27	6	92
Kansas	69	0	6	75	68	4	3	0	100
Kentucky	28	6	16	50	41	0	7	2	96
Louisiana	35	3	8	46	41	0	3	2	96
Maine	21	0	7	28	21	0	7	0	100
Maryland	13	1	1	15	14	0	1	0	100
Massachusetts	33	0	1	34	34	0	0	0	100
Michigan	66	3	11	80	75	2	3	0	100
Minnesota	52	5	22	79	36	0	0	43	46
Mississippi	31	2	5	38	34	0	4	0	100
Missouri	57	6	6	69	43	4	22	0	100
Montana	23	2	7	32	29	0	3	0	100
Nebraska	36	1	17	54	16	2	26	10	81
Nevada	10	1	13	24	21	0	3	0	100
New Hampshire	19	0	1	20	14	1	5	0	100
New Jersey	34	0	2	36	35	0	0	1	97

[1] The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.
[2] "Private" supply refers to a small well or spring used only by the carrier and the person owning it.
[3] Based on watering point sanitation as well as source of supply.

Railroad supplies for calendar year 1931—Continued

State	Source classification				Certification status				Per cent sources acted upon
	Public	Private	Railroad	Total	Satisfactory	Prohibited	Provisional	Action pending	
New Mexico	11	0	12	23	21	0	2	0	100
New York	100	2	15	117	104	1	12	0	100
North Carolina	46	1	2	49	43	1	3	2	96
North Dakota	21	2	18	41	10	0	2	29	29
Ohio	72	0	12	84	58	11	14	1	99
Oklahoma	43	1	4	48	34	3	8	3	94
Oregon	28	1	2	31	26	2	3	0	100
Pennsylvania	130	3	15	148	98	0	0	50	66
Rhode Island	2	0	0	2	2	0	0	0	100
South Carolina	28	2	1	31	30	0	0	1	97
South Dakota	22	0	8	30	12	0	6	12	60
Tennessee	29	2	8	39	35	1	3	0	100
Texas	123	11	57	191	83	0	108	0	[1] 100
Utah	12	0	4	16	16	0	0	0	100
Vermont	12	1	1	14	11	0	3	0	100
Virginia	40	3	5	48	41	1	3	3	94
Washington	23	2	4	29	24	2	3	0	100
West Virginia	34	7	6	47	44	0	1	2	96
Wisconsin	49	8	11	68	56	5	7	0	100
Wyoming	13	0	3	16	15	0	1	0	100
Total	1,863	97	400	2,360	1,713	62	415	170	92.75

[1] Based on watering point sanitation as well as source of supply.

Vessel supplies for calendar year 1931

State	Source classification				Certification status				Per cent sources acted upon
	Public [1]	Private [2]	Company	Total	Satisfactory	Prohibited	Provisional	Action pending	
Alabama	2	0	0	2	2	0	0	0	100
Arkansas	2	0	0	2	1	0	1	0	100
California	22	2	2	26	16	0	10	0	100
Connecticut	7	0	0	7	7	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	5	5	1	11	11	0	0	0	100
Georgia	2	0	0	2	2	0	0	0	100
Hawaii	3	0	0	3	3	0	0	0	100
Illinois	4	0	0	4	2	0	2	0	100
Indiana	5	0	0	5	0	1	4	0	100
Kentucky	4	0	0	4	2	0	2	0	100
Louisiana	2	0	0	2	2	0	0	0	100
Maine	10	0	0	10	8	0	2	0	100
Maryland	3	1	1	5	5	0	0	0	100
Massachusetts	17	0	0	17	17	0	0	0	100
Michigan	14	1	0	15	14	0	0	1	93
Minnesota	1	0	0	1	1	0	0	0	100
Mississippi	4	0	0	4	4	0	0	0	100
Missouri	1	0	0	1	0	0	1	0	100
New Hampshire	1	0	0	1	1	0	0	0	100
New Jersey	20	3	1	24	24	0	0	0	100
New York	13	0	0	13	12	0	1	0	100
North Carolina	2	0	0	2	2	0	0	0	100
Ohio	9	0	0	9	8	0	1	0	100
Oregon	8	0	0	8	6	0	2	0	100
Pennsylvania	7	0	0	7	0	0	0	7	0
Puerto Rico	1	0	0	1	0	1	0	0	100
Rhode Island	3	0	0	3	3	0	0	0	100
South Carolina	3	0	0	3	3	0	0	0	100
Tennessee	3	0	0	3	3	0	0	0	100
Texas	4	0	7	11	6	1	4	0	100
Vermont	1	0	0	1	0	0	1	0	100
Virginia	10	0	2	12	10	0	0	2	83
Washington	10	1	0	11	10	1	0	0	100
West Virginia	5	0	1	6	6	0	0	0	100
Wisconsin	3	0	0	3	3	0	0	0	100
Total	214	13	15	242	197	4	31	10	95.87

[1] The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.
[2] "Private" supply refers to a small well or spring used only by the carrier and the person owning it.

RECIPROCITY WITH CANADA

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 in the Great Lakes and border waters, continued with increased efficiency. During the year certificates were received from Canadian authorities covering 62 supplies used by United States carriers operating in Canada, and 28 certificates were forwarded from this office covering supplies used by Canadian carriers operating in the United States.

SUPERVISION OF WATER-SUPPLY SYSTEMS ON VESSELS

Inspection of drinking and culinary water-supply systems on vessels engaged in interstate traffic has been increased in all districts except district No. 1, where press of other work prevented. As this work is extended its value becomes more apparent to vessel owners. The number of favorable certificates issued was increased to 55.6 per cent, an increase of 13.4 per cent over the figure for the calendar year 1930. Requests for inspection and advice by companies operating vessels in foreign traffic, as well as by Federal agencies, indicate increased interest on the part of vessel-operating officials in properly protecting drinking water supplies aboard vessels.

The issuance of "Not approved" certificates was instituted during the year. While the number issued, 27, was small, it had a very salutary effect in bringing about corrective action.

While it has been possible to inspect only 57 per cent of the vessels listed as in an active status, all of the passenger-carrying vessels were inspected.

Air carriers for calendar year 1931

State	Source classification				Certification status				Per cent sources acted upon
	Public [1]	Private [2]	Company	Total	Satisfactory	Prohibited	Provisional	Action pending	
Arizona	5	1	0	6	3	0	3	0	100
Arkansas	2	0	0	2	2	0	0	0	100
California	3	3	0	6	6	0	0	0	100
Colorado	2	2	0	4	4	0	0	0	100
Connecticut	1	0	0	1	1	0	0	0	100
Florida	3	4	0	7	7	0	0	0	100
Georgia	2	1	0	3	2	1	0	0	100
Illinois	3	2	0	5	3	0	1	1	80
Indiana	0	2	0	2	1	0	0	1	50
Kansas	1	1	0	2	2	0	0	0	100
Kentucky	1	0	0	1	0	0	1	0	100
Louisiana	2	1	0	3	3	0	0	0	100
Maryland	1	0	0	1	1	0	0	0	100
Massachusetts	1	0	0	1	1	0	0	0	100
Michigan	1	0	0	1	1	0	0	0	100
Minnesota	2	1	0	3	0	0	0	3	0
Mississippi	1	0	0	1	1	0	0	0	100
Missouri	5	0	0	5	3	0	2	0	100
Nebraska	1	0	0	1	0	0	1	0	100
Nevada	1	0	0	1	1	0	0	0	100
New Jersey	2	1	0	3	3	0	0	0	100
New Mexico	0	0	1	1	1	0	0	0	100
New York	4	0	0	4	4	0	0	0	100
North Carolina	1	2	0	3	2	0	1	0	100
North Dakota	0	1	0	1	0	0	0	1	0
Ohio	5	5	1	11	6	0	0	5	55

[1] The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.
[2] "Private" supply refers to a small well or spring used only by the carrier and the person owning it.

Air carriers for calendar year 1931—Continued

State	Source classification				Certification status				Per cent sources acted upon.
	Public	Private	Company	Total	Satisfactory	Prohibited	Provisional	Action pending	
Oklahoma	1	3	0	4	1	2	1	0	100
Oregon	2	0	0	2	2	0	0	0	100
Pennsylvania	2	2	1	5	0	0	0	5	0
South Carolina	1	3	0	4	2	2	0	0	100
Tennessee	1	2	0	3	2	0	1	0	100
Texas	10	5	1	16	10	0	6	0	100
Utah	1	0	0	1	1	0	0	0	100
Virginia	0	2	0	2	1	0	0	1	50
Washington	1	0	0	1	1	0	0	0	100
Wisconsin	1	1	0	2	2	0	0	0	100
Wyoming	1	0	0	1	1	0	0	0	100
Total	71	45	4	120	81	5	17	17	85.83

The health departments of certain cities located on the Great Lakes and the Mississippi River continued the examination of water taken from vessel drinking supplies, 2,169 such examinations having been made. Of these, approximately 20 per cent failed to meet the Treasury Department bacteriological standards. On notification, the vessel companies concerned immediately instituted corrective measures. All Great Lakes vessels taking their water supplies direct from the Lakes were found to have proper treatment apparatus. During the year 333 vessels received their first inspection, 961 were reinspected, and 1,069 favorable certificates were issued.

The following table gives the status of this work during the calendar year 1931:

Vessels for calendar year 1931

District	Vessels on active status	Per cent of total vessels in district	Certification [1]				Per cent of district vessels certified	Per cent of total vessels certified
			Permanent	Temporary	Unapproved	Total		
1	826	42.93	118	317	0	435	52.6	22.60
2	104	5.41	95	8	1	104	100	5.45
3	480	24.95	433	32	5	470	98	24.42
4	151	7.85	117	10	20	147	97	7.64
5 and 6	363	18.86	306	28	1	335	91	17.41
Total	1,924		1,069	397	27	1,491		77.52

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

All cases of typhoid fever reported among passengers or crews of vessels, where indications seemed to implicate the water supply as a possible source, were investigated. During the year a total of 65 cases were reported, an increase of 2 cases over 1930. Of this number, however, only 26 occurred on vessels under the jurisdiction of the interstate quarantine regulations.

Railway Sanitation

During the year the Joint Committee on Railway Sanitation of the American Railway Association published its report on railway sanitation. This report covered several years' study in which study

representatives of the Public Health Service played a very active part. The report included in considerable detail description of methods as well as devices and can be considered as a manual on the subject. With the distribution of this report to railroad officials, as well as official State health agencies, greater uniformity in carrying on this phase of the work is expected. In general, with the exception of Illinois and Texas, the States have considered control over all phases of railway sanitation as a function of the Federal Government rather than of the State. The question of jurisdiction has been referred to a committee of the Surgeon General's Conference of State and Territorial Health Officers.

Two hundred and sixty-five inspections of railway coach yards, terminals, and water points were made by officers of this service, as time would allow. Considerable attention has been given to the question of milk served on carriers. Conferences have been held with railroad officials with reference to compliance with the interstate quarantine regulations, and dining cars have been inspected from time to time, special attention being paid to the grade and source of milk served.

Shellfish Sanitation

This work was continued along lines described in previous reports. Increased effort was necessary in maintaining proper control by the producing States due to reduced State appropriations available for this work. The distribution of lists of certified dealers continued to be the principal factor in maintaining reasonably satisfactory control. Considerable activity was carried on in connection with sanitary control over the clam industry in the New England coastal States and in New Jersey, both as to growing areas and in treatment or conditioning. Increase in areas devoted to the growing of the Japanese oyster, *Ostrea gigas*, in the Pacific Coast States has brought about increased activity in sanitary control of the shellfish industry in these States. During the year 997 certificates issued by the producing States were approved. At the close of the year the names of 1,504 shippers were carried on the approved list.

In order to determine the efficiency of the control maintained by the producing States, 10 growing areas and 539 shucking and packing plants were inspected.

The reciprocal arrangement with the Canadian Department of Pensions and National Health continued. Copies of all certificates issued by the producing States were furnished that department, which, in turn, has certified 44 Canadian shippers.

Cooperative Public Health Engineering Work

The cooperative public health engineering work with other divisions of the Public Health Service and other Federal and State agencies has been further extended during the year. A total of 1,624 engineer days, or 34.25 per cent of the time of the engineers, was devoted to this work.

Cooperation with the National Park Service and the Office of Indian Affairs, in connection with surveys, reports, preparation of plans, and

advice, continued to occupy the major part of the time devoted to this work, the time allotted amounting to 1,029 engineer days. Assistance rendered the Supervising Architect's Office required the equivalent of 159 engineer days; the Bureau of Prisons, 64 days; the Forest Service, 36 days; and the Lighthouse Service, 31 days.

National Park Service.—With the organizing of an eastern division of the National Park Service, interstate sanitary district No. 2 assumed charge of cooperative sanitary work in this division. The principal activity in the eastern area during the past year was in connection with the development of the Colonial National Monument at Yorktown, Va. For the Yorktown Sesquicentennial Celebration, held in October, 1931, it was necessary to prepare plans to care for 100,000 people and to supervise the work during the celebration. In the sanitary work collaboration of the Public Health Service with the National Park Service in this celebration was successful.

Two small sewage-treatment plants were designed for the George Washington Birthplace National Monument and an inspection of Great Smoky Mountain National Park relative to tentative locations for headquarters and other facilities were made.

As in previous years the greater part of the cooperative work with the park service was in the parks located in the West. This work included the following general activities: (1) Inspections in 18 national parks and 6 national monuments; (2) preparation of reports covering general sanitary conditions for all the parks and monuments visited, and plans, estimates, and bills of material for water supplies, sewerage, sewage disposal, and garbage disposal for parks and monuments; (3) conference with the chief landscape engineer and chief engineer of the park service regarding plans for water supplies, sewerage, and sewage disposal, etc., for the 6-year development plan; (4) conference with the utility rate expert regarding rates to be paid by operators for water, sewerage, sewage disposal, and garbage disposal where these utilities are owned and operated by the Government; (5) cooperation with the chief landscape engineer on standard plans for housekeeping cottages in the parks; (6) conferences at headquarters with superintendents of parks and custodians of national monuments regarding problems of sanitation; and (7) attendance at the conference of national-park superintendents.

In carrying out these activities the following parks and monuments were visited, and plans, estimates, and bills of materials were prepared and advice was given relative to sanitary matters: Bryce Canyon, Carlsbad Cavern, Glacier, Grand Canyon (south rim), Hot Springs, Mesa Verde, Mount Rainier, Platt, Rocky Mountain, Yellowstone, and Yosemite National Parks and Casa Grande, Tumacocori, Montezuma Castle, and Petrified Forest National Monuments.

Under the 6-year development program general plans for sewerage and sewage disposal were prepared for Gran Quivera, Pipe Springs, El Moro, and Devil's Tower National Monuments.

Public Health Service engineers continued general supervision over the operation of the sewage reclamation plant at the south rim of the Grand Canyon National Park and new sewage disposal plant at Yosemite National Park.

Office of Indian Affairs.—The activities carried on in connection with sanitation on Indian Reservations included general surveys of agencies, subagencies, hospitals, schools, and the like with plans, estimates, and bills of material for such sanitary devices as were necessary, as well as special inspections. The district engineers also acted as advisors to the superintendents in matters of environmental sanitation.

This service was supplied to 1 jurisdiction in district No. 2, 27 in district No. 3, 7 in district No. 4, and 52 in district Nos. 5 and 6.

Complete plans for a gravity type water treatment plant were prepared for Neopit, Wis., and general supervision was maintained over construction. This plant is now being operated under the general direction of the district engineer.

The time devoted to cooperative work with this bureau has increased 80 per cent over that of last year and has required 13 per cent of the time of the engineers. The greater part of this work has been carried on in districts Nos. 3, 5, and 6, requiring 25 per cent of the time of the engineers in these districts.

Supervising Architect's Office.—Assistance was given the Supervising Architect's Office in connection with water supply and sewage disposal at 23 customs and immigration stations being constructed along the international border. In each instance field investigations were made and reports with completed plans were prepared.

Bureau of Prisons.—Cooperative work with this bureau was carried on in conjunction with the work of the Mental Hygiene Division of the Public Health Service and consisted of surveys, advice on matters of environmental sanitation, review of plans of sanitary devices, and the like. General supervision was maintained over the operation of the water treatment plant at Alderson.

Surveys were made of all prison camps and advice was given relative to public health engineering matters.

Forest Service.—Cooperation with the Forest Service in matters of sanitation was similar to that given the National Park Service. Prior to the present year a relatively small amount of time was devoted to work with this service, but the indications are that this activity will increase to a considerable extent.

Lighthouse Service.—In cooperation with the superintendent of the twelfth lighthouse district, studies were made of water treatment for small vessels using Great Lakes water. These studies were carried out on the lighthouse tender *Sumac*. A small, economical treatment plant was developed, consisting of a chlorinator, designed in the office of the district engineer, a sand filter, and an activated carbon filter. Treatment consisted of superchlorination, filtration, and dechlorination.

Lectures at marine hospitals.—During the year a series of lectures on public health engineering subjects was given to the class of internes at six marine hospitals. Advice was also furnished relative to water supply and sewage disposal at service stations.

Advice was given this service in connection with water supplies and sewage disposal at airway weather stations.

Assistance was rendered to the following additional governmental agencies:

1. Coast Guard; investigation of water supply at a Coast Guard station.
2. United States Army Engineers; advice as to water supply on a vessel engaged in United States lake survey.
3. Bureau of Plant Industry; investigation of the disposal of a sugar plant waste.
4. Bureau of Mines; investigation of water treatment and sewage disposal at the helium plant.
5. Bureau of Entomology; assistance in making a mosquito survey.
6. California and Arizona; conference and advice relative to disposal of sewage in the Colorado River.
7. City of Los Angeles, Calif.; conference and advice relative to air pollution.
8. Tri-State Treaty Commission; assistance in obtaining information relative to pollution of coastal waters in the vicinity of New York.

Mosquito Control, District of Columbia

The mosquito control work continued as organized in 1930, with the coordination and general supervision under the direction of the Public Health Service. The major agencies interested in this work are the District of Columbia (sewer department) and the Office of Public Buildings and Public Parks; but, in addition, there are some 28 other Federal and district agencies having jurisdiction over certain areas. Through the cooperation of all agencies involved, well coordinated control has been possible.

With increased knowledge regarding the species of mosquitoes to be dealt with, their characteristics, and their actual and potential breeding places, and by the use of certain mechanical equipment so designed as to permit fixed labor charges to be materially lowered, it has been possible to carry on the work at a material saving in cost as compared with that of 1931. It is expected that certain other costs can be materially lowered in 1933 by the employment of new methods of larvicidal treatment which are now in the experimental stage.

Summary of Work Carried on by the Various Districts

Distribution of time in days of the field personnel under the engineering section (exclusive of mosquito control in the District of Columbia), fiscal year 1932

	Days
Interstate quarantine:	
Office	1,684
Field—	
Water	831
Shellfish	233
National Park Service:	
Office	187
Field	224
Office of Indian Affairs:	
Office	436
Field	182
Supervising Architect's office:	
Office	116
Field	43
Bureau of Prisons:	
Office	39
Field	25
Other agencies:	
Office	136
Field	236
Technical meetings	54
Leave	315
Total days accounted for	4,741

TABULAR SUMMARY

TABLE 1.—*Vessel water supply supervision*

First inspections:	
Passenger	175
Freight	146
Water boats	12
Reinspections:	
Passenger	456
Freight	490
Water boats	14
Certificates issued:	
Regular, favorable—	
Passenger	450
Freight	605
Water boats	16
Regular, not approved	27
Temporary, favorable—	
Passenger	37
Freight	394
Water boats	7
Major conferences:	
With shipping officials	126
With others	36
Water examinations made:	
U. S. Public Health Service laboratories	0
Other laboratories	2, 227
Typhoid fever cases reported:	
U. S. Public Health Service hospitals	51
U. S. Public Health Service quarantine stations	7
Health departments	7
Plans of vessel water systems examined:	
Approval withheld	2
Approval granted	3

TABLE 2.—*Railroad sanitation supervision*

Inspections:	
Sources of water supply	178
Coach yards	72
Terminals	34
Watering points	159
Dining cars	36
Certification:	
Data reports reviewed	2, 450
Certificates prepared for States	4, 327
Water examinations made:	
U. S. Public Health Service laboratories	217
Other laboratories	401
Major conferences:	
With railroad officials	69
With others (principally health authorities)	99

TABLE 3.—*Shellfish sanitation supervision*

Inspections:	
Area	10
Plants	539
State certificates:	
Approved	997
Not approved	0
Approval withdrawn	1
Cancelled	45
Laboratory examinations made:	
U. S. Public Health Service laboratories	114
Other laboratories	[1]1,130
Conferences	75

TABLE 4.—*Miscellaneous*

Cooperation with governmental agencies:	
Public Health Service—	
Surveys	8
Conferences	28
Office of Indian Affairs—	
Surveys	55
Conferences	52
National Park Service—	
Surveys	42
Conferences	72
Federal Penitentiaries—	
Surveys	15
Conferences	22
Supervising Architect's Office—	
Surveys	23
Conferences	42
Cooperation with governmental agencies—Continued.	
Lighthouse Service—	
Surveys	8
Conferences	26
Forest Service—	
Surveys	12
Conferences	3
Other governmental agencies—	
Surveys	8
Conferences	44

[1] District No. 1 only.

Rural Health Work

One hundred and forty-four cooperative health projects in 28 States, under the direction of local whole-time health officers, were carried on for studies of and demonstration work in rural sanitation through the use of the regular annual appropriation provided for the fiscal year which ended June 30, 1932. The number of such projects was 69 less than the total for the preceding year, for the reason that a somewhat larger proportion of the fund available was used for special research in methods of local health administration and for supervisory work in the field.

The States, with their respective number of cooperative health projects, are as follows:

State	Number of projects	State	Number of projects	State	Number of projects
Alabama	5	Kentucky	17	Ohio	1
Arizona	5	Louisiana	10	Oregon	2
Arkansas	6	Maryland	1	South Carolina	18
California	6	Massachusetts	1	South Dakota	1
Florida	3	Michigan	10	Tennessee	6
Georgia	5	Mississippi	3	Texas	4
Idaho	1	Missouri	5	Virginia	6
Indiana	1	Montana	3	Washington	2
Iowa	3	New Mexico	6		
Kansas	5	North Carolina	7	Total	144

The regular appropriation for the rural sanitation work of the Public Health Service for the fiscal year which ended June 30, 1932, was $338,000. Against this amount appropriated, $2,300 was set up as a budget saving, $318,748.47 was expended through specific allotments to the 144 cooperative health projects, and $19,788.88 was used for special studies of rural sanitation and administration. As provided in the appropriating act, no part of the fund was made available to any community unless the State, county, or municipality in which the community was located, agreed to pay at least one-half the expense of the demonstration health work.

According to data collected by the Rural Sanitation Office from the State health departments, the number of counties or comparable governmental divisions provided with health service reaching all rural sections thereof, and under the direction of local whole-time health officers, was 616 at the beginning of the calendar year 1932. This represented a gain of 59 over the figure for the preceding year. However, these projects are serving slightly less than 30 per cent of the entire rural population of the United States. It is obvious that progress in the development of county health work must be much more rapid if the entire rural population of the United States is to provide itself with adequate health service within a reasonable time. Since the assistance given by the Federal Government plays an important part in the establishment of permanent locally supported service, continued cooperation on the part of the Public Health Service on a larger scale in this activity is essential to more rapid extension.

The emergency drought relief fund of $2,000,000, which was appropriated to the Public Health Service on February 6, 1931, for cooperation with the States in the drought-stricken areas in studies of

and demonstration work in rural sanitation, was available until June 30, 1932. The act authorizing the emergency appropriation differed from the regular rural sanitation act in the following provisions:

1. The fund was limited to the drought-stricken areas.
2. The proportion of the expenses of such demonstration work in any community was to be regulated by the Public Health Service with due consideration given to State and local economic conditions and human needs.
3. The appropriation was available for purchase and distribution of medical supplies.

Reports from the Department of Agriculture on crop conditions, from the Weather Bureau on precipitation, and from the Red Cross on their findings of economic conditions throughout the United States were used as guides in determining which areas would come under the provisions of this act. Twenty-two States were considered to be partly or wholly within the drought-stricken areas.

The first cooperative budgets under the appropriation became effective March 1, 1931, and the work was extended through June 30, 1932. From the fund made available for this work, $1,954,024.30 was expended through specific allotments to the 472 cooperative health projects in the 21 States, while $33,963.20 was used for special activities and administration.

The States in which the emergency drought relief cooperative health projects were conducted, under approved budgets, together with the number and character of projects in each State, are as follows:

Drought-relief cooperative health projects

State	Total projects	Counties	Districts	Towns	Mobile units	Central administration
1. Alabama	32	31	(2) 1			
2. Arkansas [1]	74	71	(2) 1		1	1
3. Georgia	9	3	(7) 2		1	3
4. Illinois	3		2			1
5. Indiana	21	19		1		1
6. Kansas	4	4				
7. Kentucky	67	66				1
8. Louisiana	23	21				2
9. Mississippi	25	20	(2) 1			4
10. Missouri	12	7	(45) 5			
11. Montana	3	1	(4) 1			1
12. North Carolina	18	18				
13. North Dakota	1					1
14. Ohio	27	24				3
15. Oklahoma	12	9			1	2
16. Pennsylvania	1					1
17. South Carolina [2]						
18. Tennessee	32	24	(11) 5		2	1
19. Texas	30	8	(92) 19		1	2
20. Virginia	48	34	(27) 9		1	4
21. West Virginia	30	26	(4) 2			2
Total	472	386	(196) [3] 48	1	7	30

[1] 7 projects paid from regular rural sanitation funds last half of fiscal year 1932.
[2] Biologics only.
[3] Counties in "Districts," not included under "Counties."

An endeavor was made 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.

Following is a statement of a few of the outstanding and important services which were rendered by the emergency health organizations created within the drought-stricken areas through the cooperation of the Public Health Service with the State and local governments:

Immunizations:	
a. Complete antityphoid vaccinations	1, 663, 496
b. Antismallpox vaccinations	568, 148
c. Diphtheria immunizations	875, 331
d. Prophylactic diphtheria antitoxin	16, 842
Child hygiene:	
a. Prenatal cases given advice	35, 817
b. Children examined	1, 421, 469
c. Number found defective	744, 785
d. Number defects found	1, 371, 413
e. Corrections of physical defects induced	225, 975
f. Exclusions from school for communicable diseases	26, 721
Communicable disease control:	
a. Visits to cases, carriers, etc	126, 239
b. Cases isolated or quarantined	51, 882
Venereal disease control:	
a. Examinations	50, 893
b. Prophylactic treatments	1, 434
c. Curative treatments	150, 248
Tuberculosis control:	
a. Number persons examined	38, 002
b. Number found positive	9, 783
Sanitary privies installed	80, 532
Dwellings screened	13, 595

It is a great satisfaction to be able to report that the purpose of this special appropriation act was fulfilled, since no unusual outbreak of communicable disease developed during the period for which the appropriation was made, and health conditions in general were improved in spite of the economic distress which existed in the areas where the work was done.

In an effort to improve the content and character of local service in county health units in which the Public Health Service was cooperating, special advisory and consultant services were provided and offered to State health authorities in connection with maternal and child health work and certain phases of environmental sanitation. Two officers detailed to this work visited States from which invitations were received, and they assisted in reorganization of State health department facilities for supervising local activities in these particular fields. The effect of this service has manifested itself in improvement in many localities.

A special cooperative project in malaria control was carried on in the State of Texas during the year. All but a very small part of the cost of this work was borne out of a special fund appropriated by the State legislature. Expert supervision was given by the Public Health Service on request of the State health department with a view to assisting in a demonstration of the value of a permanent local malaria control program for certain sections where this disease is unusually prevalent.

Conference of the Surgeon General with the State and Territorial Health Officers

In accordance with the act of July 1, 1902, the Thirtieth Annual Conference of State and Territorial Health Officers with the Public Health Service was held June 4 and 6, 1932, in Washington, D. C.

Delegates from 36 States, the District of Columbia, and the Canal Zone were in attendance.

The following papers were presented and discussed:

1. The Determination of Public Health Needs and the Evaluation of Procedure.
2. Minimum Standards of Qualifications as a Basis for Employment of Local Health Personnel.
3. The Virginia Plan of Immunization Against Diphtheria.
4. The Certification of Water Supplies Used by Interstate Carriers.
5. Accidents and Accident Prevention.
6. Safeguarding Cyanide Fumigation.
7. Volatile Poisons.
8. Activities of the Public Health Service Relating to Narcotic Addiction and the Public Health Aspects of the Problem.
9. Preliminary Report on Results of a Survey to Determine the Relative Effects of Heated and Raw Milk Upon Child Weight and Height.
10. Specific Therapy in the Prevention and Treatment of Scarlet Fever.
11. The Present Status of the Morbidity Reporting Area.
12. The Registration of Births and Deaths on Indian Reservations.
13. Induced Malaria in the Treatment of Paresis not a Menace to the Locality.

DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION

In charge of Asst. Surg. Gen. F. A. CARMELIA

QUARANTINE TRANSACTIONS

During the fiscal year 1932, medical officers of the Public Health Service engaged in the administration of the United States quarantine laws inspected 18,048 vessels and 2,407,154 persons. Of these, 13,256 vessels 630,444 passengers, and 998,471 members of crews were inspected at the continental maritime stations. At insular stations, 2,619 vessels, 122,617 passengers, and 205,146 members of crews were inspected. At foreign stations, 2,173 vessels, 201,563 passengers, and 160,761 members of crews destined for ports of the United States were inspected. There were 1,414 vessels fumigated or disinfected at continental stations, 626 at insular stations, and 415 at foreign stations. At the border quarantine stations there were 88,152 travelers inspected exclusive of the local interurban traffic, numbering 8,798,598 who were under surveillance. In addition, 2,205 airplanes arrived at official airports of entry in the United States from foreign ports requiring quarantine inspection; a total of 17,387 persons carried on these planes were accorded medical examination prior to entry.

GENERAL PREVALENCE OF QUARANTINABLE DISEASES

Yellow fever.—An outbreak of yellow fever was reported during March, 1932, in a rural section in the hinterland served by the port of Victoria, Brazil. Victoria is a port of call for many regular line vessels trading between Gulf and Atlantic ports of the United States and east coast of South America, and the sanitary condition existing in that port is consequently of particular significance. Yellow fever is present also in other sections of Brazil and in the Gold Coast in Africa; one case was reported in Nigeria and one case and one death was reported in Dahomey.

Cholera.—As in previous years cholera was more prevalent on the continent of Asia than elsewhere. The epidemic of cholera which began about May 1, 1932, in the vicinity of Shanghai and Canton, began spreading southward and threatened to assume serious proportions. Special precautions were adopted to protect United States territory, particularly the Philippine Islands, against the introduction of this disease from China. The outbreak of this disease which occurred in the Philippine Islands in May, 1930, continued until the early part of the calendar year 1932, although the number of cases reported were not alarming. Cholera appears every year in parts of Asia, and under present conditions outbreaks in the Philippine Islands may be expected. The precautions taken to prevent the introduction of this disease into the United States proved effective as no cases made their appearance in the continental United States.

Plague.—During the year plague in human beings was not reported in the continental United States, although several cases of plague in rodents occurred in Los Angeles, Calif. Human plague and rodent plague were reported in the islands of Hawaii and Maui during the fiscal year, and vessels arriving from ports in the infected areas of these islands were required to undergo quarantine inspection upon arrival at ports in the United States, together with any fumigation required. These restrictions remained in force until the latter part of the fiscal year, when quarantine officers were authorized to exempt such vessels from mandatory fumigation when careful rat infestation showed negative indications and appreciable amounts of cargo of a rat-attractive or rat-harboring nature were not loaded at ports serving the infected areas, provided that bills of health issued at such ports showed suitable precautions taken as regards both the vessel and its cargo in such ports.

There was reported during October, 1931, an epidemic of bubonic plague in the districts of Linhsien, Hsinghsien, and Paoteh, western Shansi Province, China. The disease gradually swept eastward, reaching Kolan Lanhsi in a short time. The disease had its highest mortality at Hsinghsien, where 2,000 deaths occurred among the thousands of victims. The Provincial Plague Preventative Bureau despatched medical relief, and it was reported that complete isolation of the areas concerned was ordered. This serious outbreak was of considerable potential import from a quarantine standpoint. By reason of its wide geographical distribution and the means of spread, plague 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 countries of the world. There was a reported increased prevalance of this disease during the year in the Orient, particularly from Shanghai, Hong Kong, and Amoy, and appropriate quarantine restrictions, including vaccination, were enforced against these ports. The sanitary condition existing in these ports is of particular significance, due to their close proximity to the Philippine Islands.

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, Egypt, Roumania, Tunisia, Morocco, Algeria, Bulgaria, Lithuania, Yogoslavia, Czechoslovakia, Greece, and Portugal, and appeared to a limited extent in the Irish Free State, Spain, Italy, Germany, and Austria. The number of cases occurring, however, has decreased annually since the World War, but the disease still continues to be widespread.

Changes in Quarantine Procedure

During the past fiscal year a change has been made in the deratization requirements of vessels arriving at United States ports from foreign ports, through the issuance of Foreign Quarantine Division Circular No. 49, dated August 8, 1931. This modification has been

made under the provisions of the International Sanitary Convention of Paris and in recognition of the improved sanitary conditions and efficient administration in effect in many foreign ports. Prior to the issuance of this circular, vessels arriving at ports in the United States from foreign ports in which human or rodent plague had been reported to exist were required to undergo fumigation for the destruction of rodents before free pratique was given at ports of arrival. Under the present regulations, vessels arriving at United States ports which have called at plague-infected ports within 60 days prior to arrival may be exempted from fumigation, in the discretion of the quarantine officer, if the vessel carries an acceptable certificate of deratization dated subsequent to date of call at such ports, or an acceptable deratization exemption certificate based upon that degree of rat proofing attaining control of rat infestation aboard, and the vessel does not carry appreciable amounts of rat-attractive or rat-harboring cargo, and the quarantine officer is satisfied following careful examination of all accessible parts of the vessel and due consideration of all factors involved that neither the vessel nor its cargo is rat-infested and does not present a potential danger of introducing plague.

It is now the established procedure at ports in the United States to make inspections to determine the amount of rat infestation before deciding upon fumigation, and discretion is vested in quarantine officers to determine whether or not a vessel requires fumigation, who base their decision upon the condition of the vessel upon arrival, particularly as to whether the degree of rat proofing attains control of rat infestation aboard and whether the vessel carries appreciable amounts of rat-attractive or rat-harboring cargo. Experience has shown that fumigation of a loaded vessel destroys approximately 80 per cent or more of the rats on board, and it is now not an unusual procedure to fumigate a loaded vessel when such is indicated following rat infestation inspection.

Increasing attention has been given internationally in recent years to the question of the fumigation of ships, particularly with hydrocyanic acid gas, for the destruction of rats. Article 28 of the International Sanitary Convention of Paris, revised 1926, provides that vessels, except those employed in national coastwise service, must be periodically deratized or be permanently kept in such condition that the rat population is reduced to a minimum. Realizing the importance of the subject from an international point of view, the health committee of the League of Nations, in consultation with the permanent committee of the International Office of Public Hygiene, in Paris, set up in the early spring of 1928 a Commission on the Fumigation of Ships, under the chairmanship of the Surgeon General of the United States Public Health Service. At their first meeting in Paris on May 14, 1928, a program was drawn up, and the following spring a preliminary report of the investigations, made in conformity with these recommendations, was submitted by the chairman. In the meantime the New York quarantine station was engaged in carrying out work along the lines recommended and much valuable information was obtained, and in anticipation of the proposed visit to the United States of the Committee of Fumigation Experts a résumé report of these investigations was prepared as a guide. The committee visited the United States in the fall of 1931 and made some practical studies in ship fumigation, principally at the New York quarantine station.

At the close of their visit they prepared a very interesting and informative report on these studies, which formed the basis for much discussion at the meeting of the permanent committee of the International Office of Public Hygiene, in May, 1932, and it was proposed that further discussion of the matter be made at future meetings.

International Agreements

During the early part of the fiscal year an informal agreement was entered into between the Public Health Service and the quarantine service of Cuba, providing for the mutual recognition by the United States quarantine authorities and by the Cuban quarantine authorities of certificates of deratization and certificates of deratization exemption given to maritime vessels by either authority, respectively. This agreement is in accord with the provisions of article 7 of the Pan American Sanitary Code and will ordinarily serve to relieve ships which have been granted certificates of deratization exemption by quarantine officers of the United States from the necessity of undergoing fumigation for deratization purposes upon arrival at Cuban ports, as had been the practice heretofore.

Similarly, at the close of the fiscal year negotiations for a reciprocal arrangement between the Government of the United States and the Mexican Government were being perfected, through the State Department, whereby quarantine, customs and immigration inspection procedures may be accomplished in Mexican territory by employees of the United States on certain northbound trains from Mexico entering the United States at Laredo, reciprocal privileges being granted for the performance in United States territory of similar procedures on southbound trains from the United States to Mexico via Laredo by employees of the Mexican Government.

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, and the regulations promulgated thereunder remained in force during the fiscal year. A slight outbreak of psittacosis occurred in New York City during October and November, 1931, and subsequently a more serious outbreak of this disease occurred in California, which resulted in the drafting of a resolution by the health authorities of California providing state-wide prohibition of importation or exportation of birds of the parrot family. This resolution was designed to prevent the further introduction of birds infected with psittacosis from foreign sources and allow time to determine whether the disease was already established in local aviaries, and it was proposed that this restriction remain in effect at least six months. Officers of the Public Health Service cooperated with the State authorities in the enforcement of these regulations, and consideration is now being given to the advisability of a further revision of the present Federal regulations governing the importation of parrots to specifically include all birds of the parrot family and to possibly impose some additional restrictive requirements, or else succinctly place a complete embargo against the importation of all birds of the parrot family. In the meanwhile, research studies are being continued in an endeavor

to obtain additional information respecting the causative organism of this disease and a means for the prevention of its introduction and spread.

The problem of the satisfactory control of psittacosis has become of international interest in recent years, resulting in the appointment of a commission by the permanent committee of the International Office of Public Hygiene, of Paris, to make a study of this problem and to make recommendations. At the May, 1932, meeting of the permanent committee, the commission examined the measures proposed at the previous meeting for the prevention of the spread of this disease, which included the following: (*a*) In the countries of origin of the birds, export only from designated ports, preceded by a quarantine under veterinary surveillance; (*b*) regulations concerning the care to be given to birds during transportation by sea; (*c*) eventually a quarantine at the port of arrival, under veterinary control. Since the psittacosis outbreak in 1929, various countries of the world, including almost all the European countries, have promulgated regulations prohibiting the importation of birds of the parrot family; and while the commission did not come to any definite conclusions, it recommended that temporary prohibition be maintained and that the subject receive further study.

Meningococcus (Cerebrospinal) Meningitis

The special regulations prescribed under the provisions of 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, particular attention being given by quarantine officers at oriental ports of embarkation to section B of these regulations, relating to the number of steerage allowed to be carried under the navigation act of 1882, for the purpose of making appropriate notations on bills of health issued to these vessels for the information of quarantine officers at United States ports. There was a reported increased prevalence of this disease in the Orient, especially in Hong Kong, Canton, and Macao, in the spring of the fiscal year, but this situation did not prove alarming.

Sanitary Control of Aerial Navigation

The sanitary control of aerial navigation has constituted one of the major problems in recent years, not only in this country but in the countries of Latin America and of Europe, Asia, and Africa. With steady increase in passenger traffic by air, the establishment of airlines connecting practically all countries, and the ever-increasing speed with which air travel is being accomplished, more and more has the public health aspect of air transport service assumed definite proportions in the problems of these countries.

In 1920 the Public Health Service first took cognizance of the danger, from a sanitary viewpoint, inherent in international aerial navigation, and under the broad authority of the maritime quarantine act of 1893 the Secretary of the Treasury included, by amendment of the quarantine regulations issued thereunder, provision for a modified quarantine procedure for aircraft coming from foreign ports, including inspection upon arrival in United States ports. The

enactment of the air commerce act of 1926 definitely confers upon the Secretary of the Treasury the authority to provide by regulation for the application to civil air navigation of the laws and regulations relating to the administration of public health laws to such extent and upon such conditions as he deems necessary, and provides a penalty of $500 for any violation thereof.

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 International Convention for the Sanitary Control of Aerial Navigation, which was drawn up by the permanent committee of the International Office of Public Hygiene, in Paris, at the May, 1930, meeting. This proposed convention formed the principal topic for discussion at the two meetings of the permanent committee in May and October, 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. The views of these two most important international public health bodies were incorporated in a final draft which was presented during the year for the informal consideration and recommendation of various interested governments; and the comment and recommendations submitted by responding governments received the further consideration of the permanent committee at its meeting in Paris in April, 1932. It is anticipated that the revised draft convention will soon be formally presented to the various interested governments for ratification.

Much interest has been manifested in the possible transmission of disease by mosquitoes on airplanes; and for the purpose of determining whether or not mosquitoes are carried on planes and the distance of such transportation, the Public Health Service during the past year carried out some experiments along these lines. To test the question of the transmission of mosquitoes by planes, resort was had to the expedient of collecting species of *Aëdes aegypti* mosquitoes and putting them on board airplanes at selected tropical ports, after staining them with an aqueous solution of eosin to make them recognizable at port of arrival. These experiments showed that approximately one-fifth of the original number were transported long distances in one day with repeated landing and opening of doors, hatches, and windows, and refueling, unloading, and loading taking place. However, notwithstanding the fact that airplanes may and do transport mosquitoes, this mode of introduction of mosquito-borne disease is probably secondary in importance to the importation of an infected person. With the relatively small number of mosquitoes carried by aircraft and the facility with which airplanes may be freed from mosquitoes at port of departure, it may safely be concluded that, while there is a recognized danger, there is no obstacle to the efficient treatment of airplanes so as to destroy mosquitoes and avoid retardation of air-traffic progress.

Construction of Quarantine Facilities

The need for new quarantine facilities to serve the growing port of Los Angeles has been recognized for many years, and in 1928 an item for the acquisition of a site and funds for construction, in the amount of $70,000, was included in the public-building program.

An act of Congress approved July 3, 1930, authorized the War Department to transfer to the Treasury Department, without transfer of funds, a tract of land suitable for quarantine purposes in the port of Los Angeles, and under date of June 6, 1932, the Secretary of War transferred to the Treasury Department for this purpose a rectangular tract of land comprising the southwestern corner of Reservation Point.

Pursuant to the provisions of the second deficiency act approved July 3, 1930, which authorized the Secretary of War to transfer to the Treasury Department a tract of land suitable for a new quarantine station at Miami (Miami Beach), Fla., and carried an appropriation of $65,000 for the construction of such station, the Secretary of War under date of June 20, 1931, transferred to the Treasury Department without transfer of funds, a tract of land of approximately 13.91 acres situated on Terminal Island at the south side of the Miami Channel. Construction of this station is now under way.

During the past fiscal year a site comprising approximately 35 acres has been offered to the Treasury Department at Point Hudson, Wash., by the Port Townsend Chamber of Commerce, for use as a quarantine station. This site is immediately adjacent to Port Townsend, at the entrance to Port Townsend Bay. Funds for the construction of a quarantine station have not yet been appropriated; however, in House Document No. 788, Seventy-first Congress, there is included an item for the construction of a new quarantine station for Port Townsend under the heading "allocated to be appropriated," at an estimated limit of cost of $250,000. Negotiations are now being conducted between the Treasury Department and the Port Townsend Chamber of Commerce concerning the actual transfer of this property.

Floating Equipment

During the year considerable progress has been made in bringing up to an efficient standard the floating equipment used at quarantine stations, now comprising 62 steam and Diesel tugs and launches. Replacements and maintenance of this equipment continued to be under the supervision of a graduate naval architect, employed in the office of the Surgeon General, who not only planned and prepared designs for new equipment, including detailed specifications for their construction under contract, but also personally supervised the actual construction. In addition, plans and specifications covering all major repairs of floating equipment have been prepared and the performance of the work has been supervised in the more important repairs by the naval architect. The results achieved have been noteworthy. Not only has the general maintenance of this equipment been improved, but the costs at the same time have been lowered.

During the year a most modern Diesel electric tug, the *Walter Wyman*, was completed and placed in service at the New York quarantine station. This vessel is notable by reason of its ruggedness, and excellent efficiency and adaptability. The hull is constructed of wrought-iron plates and rivets, giving assurance of reduced upkeep and prolonged life. The Public Health Service pioneered in reverting to the old-fashioned use of wrought iron in the construction of this hull. The adoption of this old-time practice attracted considerable

attention, which precedent was followed in the recent construction of several similar vessels for commercial use and the use of other Government agencies.

Four small wooden work launches, 40 feet in length, and equipped with full Diesel-type engines, were also constructed during the year for general utility service. These boats, constructed of one design, were designated the *Q–15*, *Q–16*, *Q–17*, and *Q–18*, and were assigned, respectively, to the Galveston (Tex.), Mobile (Ala.), San Francisco (Calif.), and Marcus Hook (Pa.) quarantine stations. These boats are very economical, owing to their being equipped with Diesel engines and being arranged for 1-man control and operation, and they have low maintenance costs, owing to their specialized design and extra heavy construction.

Quarantine Transactions at Continental and Insular Quarantine Stations

TABLE 1.—*Summary of quarantine transactions at continental and insular stations for the fiscal year 1932*

(1) INSPECTIONS

	Total number	Passed free pratique	Passed provisional pratique	Detained	Remarks
Vessels	15,875	11,677	4,198	188	
Seamen	1,203,617				Includes workaways.
Passengers	841,213				Includes stowaways.

(2) DETENTIONS

	Typhus		Cholera		Smallpox	
	Number	Days	Number	Days	Number	Days
Vessels	1	1	1	1	3	4
Seamen	0	0	196	196	115	290
Passengers	3	41	506	506	9	20
Sick	1	17	2	2	1	32

(3) LABORATORY

Number of rats examined	4,371
Number of fleas classified	3,452
Number persons vaccinated (for smallpox)	12,084
Number persons vaccinated (for cholera)	867
Other examinations:	
Stools examined for cholera	5,761
Nasal swabs examined for meningococcus	4,949

(4) TREATMENT OF VESSELS (FUMIGATING, TRAPPING, REMANDING)

(A) FUMIGATION

	Cyanide	Sulphur	Total
Vessels	1,439	601	2,040
Cubic feet fumigated	577,785,941	38,093,282	615,879,223
Net tonnage	4,235,431	1,346,038	5,581,469
Rats recovered	6,809	1,583	8,392

(B) TRAPPING

Number of vessels	6
Net tonnage	45,133
Number of traps	646
Number of rats	86

TABLE 1.—*Summary of quarantine transactions at continental and insular stations for the fiscal year 1932*—Continued

(4) TREATMENT OF VESSELS (FUMIGATING, TRAPPING, REMANDING—Continued

(C) REMANDS FOR FUMIGATION

	Mandatory vessels	Periodical vessels	For other purposes
From other ports	203	297	76
To other ports	222	278	28

(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 $284, 341. 96

(7) PORT SANITARY STATEMENTS AND BILLS OF HEALTH ISSUED

Number issued 45, 522

(8) MEDICAL EXAMINATIONS OF ALIENS AT QUARANTINE STATIONS

	Number examined	Intensive	Class certified				Total certified
			A-I	A-II	B	C	
Passengers	60, 057	3, 693	5	49	246	66	366
Alien seamen	402, 118	131, 382	40	553	114	147	854

TRANSACTIONS AT CONTINENTAL MARITIME STATIONS

TABLE 2.—*Summary of transactions at continental maritime stations for the fiscal year, 1932*

Station	Vessels inspected	Vessels fumigated		Passengers inspected	Crew inspected
		Cyanide	Sulphur		
Aberdeen, Wash	8	0	2	0	294
Angel Island, Calif. (San Francisco)	561	123	0	30, 150	42, 371
Astoria, Oreg	46	13	0	0	1, 752
Baltimore, Md	620	139	0	382	20, 477
Beaufort, S. C	0	0	0	0	0
Boca Grande, Fla	10	0	0	1	313
Boston, Mass	917	121	0	26, 020	58, 548
Brunswick, Ga	10	0	0	0	253
Carrabelle, Fla	0	0	0	0	0
Cedar Keys, Fla	0	0	0	0	0
Charleston, S. C	132	6	5	165	4, 317
Corpus Christi, Tex	37	0	5	17	1, 370
Eastport, Me	3	0	0	0	65
Eureka, Calif	1	0	0	0	33
Fall River, Mass	52	0	0	0	1, 919
Fernandina, Fla. (Cumberland Sound)	2	0	1	0	94
Fort Bragg, Calif	0	0	0	0	0
Fort Pierce, Fla	0	0	0	0	0
Fort Monroe, Va	305	10	49	1, 340	11, 960
Freeport, Tex	15	0	0	2	508
Galveston, Tex	749	53	0	2, 740	27, 455
Georgetown, S. C	2	0	0	0	22
Gloucester, Mass	0	0	0	0	0

TABLE 2.—*Summary of transactions at continental maritime stations for the fiscal year, 1932*—Continued

Station	Vessels inspected	Vessels fumigated		Passengers inspected	Crew inspected
		Cyanide	Sulphur		
Gulfport, Miss.	23	0	3	11	783
Jacksonville, Fla. (St. Johns River)	102	12	0	390	3,425
Key West, Fla.	156	0	5	9,452	10,375
Lewes, Del. (Delaware Breakwater)	0	0	0	0	0
Marcus Hook, Pa.	683	104	0	1,034	24,549
Marshfield, Oreg. (Coos Bay)	7	0	3	0	246
Miami, Fla.	672	27	0	14,881	18,860
Mobile, Ala.	231	[1] 9	1	241	6,442
Monterey, Calif.	0	0	0	0	0
Morgan City, La. (Atchafalaya)	0	0	0	0	0
New Bedford, Mass.	14	0	1	73	351
New London, Conn.	4	0	0	13	329
New Orleans, La.	1,242	140	0	9,460	48,081
Newport, Oreg.	0	0	0	0	0
Newport, R. I.	3	0	0	3	90
New York, N. Y.[3]	3,821	283	0	497,196	562,421
Ogdensburg, N. Y.	0	0	0	0	0
Panama City, Fla.	18	0	0	0	685
Pascagoula, Miss.	0	0	0	0	0
Pensacola, Fla.	49	8	0	23	1,568
Plymouth, Mass.	4	0	0	0	82
Port Aransas, Tex.	0	0	0	0	0
Port Everglades, Fla.[1]	17	0	0	3,119	3,061
Portland, Me.	121	0	4	68	3,909
Portland, Oreg.	15	8	0	0	570
Port St. Joe, Fla.	0	0	0	0	0
Port San Luis, Calif. (San Luis Obispo)	24	0	0	0	927
Port Townsend, Wash.[4]	151	69	3	7	2,529
Providence, R. I.	86	0	0	1,963	4,013
Sabine, Tex.	207	10	0	75	6,918
San Diego, Calif. (Point Loma)	462	0	4	14,794	34,095
San Pedro, Calif.	1,201	132	0	16,131	82,476
Santa Barbara, Calif.	0	0	0	0	0
Savannah, Ga.	103	30	0	180	3,103
Searsport, Me.	8	0	0	0	121
Southbend, Wash.	3	0	1	0	119
Southport, N. C. (Cape Fear)	43	0	6	71	1,414
Tampa, Fla.	216	24	0	253	4,767
Vineyard Haven, Mass.	2	0	0	0	16
Washington, N. C.	0	0	0	0	0
West Palm Beach, Fla.	98	0	0	189	395
Total	13,256	1,321	93	630,444	998,471

[1] Opened Jan. 1, 1932.
[2] Fumigated with formaldehyde
[3] Includes Perth Amboy, N. J.
[4] 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 1932*

Location	Name of airport	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	[2]					
Albany, N. Y	——do		Sept. 28, 1928						
Ajo, Ariz	——do	6	Nov. 15, 1929	11	0	22	0	0	0
Bellingham, Wash	Graham Airport [1]		Apr. 18, 1930	26	0	41	0	0	0
Boston, Mass	Boston Airport [3]			2	2	4	4	4	0
Brownsville, Tex	Municipal Airport	5	Jan. 8, 1930	509	448	2,835	2,677	1,118	11
Buffalo, N. Y	——do		June 10, 1929	0	0	0	0	0	0
Calais, Me	Pan American Airways Seaplane Base, St. Croix River.		July 23, 1931	23	0	196	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	3	3	16	16	0	0
Eagle Pass, Tex	Eagle Pass Airport [1]	1½	Mar. 5, 1930	2	2	8	8	0	0
El Paso, Tex	El Paso Municipal Airport [1]	9	Aug. 15, 1929	110	110	413	413	97	2
Great Falls, Mont	Vance Airport [1]		June 2, 1930	[2]					
Havre, Mont	Municipal Airport [1]		——do	0	0	0	0	0	0
Juneau, Alaska	Juneau Airport [1]		June 18, 1930						
Ketchikan, Alaska	Ketchikan Airport [1]		——do						
Key West, Fla	Meacham Field	5	Dec. 20, 1929	4	4	11	11	0	0
Laredo, Tex	Laredo Airdrome [1]	3½	Jan. 24, 1930	14	14	31	31	1	0
Malone, N. Y	Port of Malone [1]		Apr. 18, 1930	0	0	0	0	0	0
Miami, Fla	Pan American Field	8½	Oct. 16, 1928						
	Dinner Key	6	Mar. 7, 1930	1,196	1,196	11,281	11,281	1,255	9
	Curtiss-Wright Field [1]	⅛	Apr. 22, 1930						
Minot, N. Dak	Port of Minot		Nov. 30, 1931	[2]					
New York, N. Y	Newark Metropolitan Airport		Jan. 2, 1929	0	0	0	0	0	0
Nogales, Ariz	International Airport	9	June 27, 1929	26	26	79	79	3	0
Newport, Vt	Canadian Gateway		Aug. 1, 1929	0	0	0	0	0	0
Ogdensburg, N. Y	Billings Field		Jan. 8, 1930						
	Ogdensburg Harbor [1]		Mar. 1, 1932	2	2	4	0	0	0
Pembina, N. Dak	Municipal Airport [1]		Feb. 2, 1930	[2]					
Plattsburg, N. Y	Mobodo Airport [1]		June 2, 1930	[2]					
Portal, N. Dak	Portal Airport [1]		Jan. 8, 1930	0	0	0	0	0	0
Port Angeles, Wash	Port Angeles Airport [1]	52	——do	0	0	0	0	0	0

[1] Temporary permission. [2] No medical officer of Public Health Service. [3] Authorized for use but not officially designated.

TABLE 3.—*Summary of transactions at continental and insular stations for the fiscal year 1932*—Continued

Location	Name of airport	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
Port Townsend, Wash	Port Townsend Airport [1]	12	June 18, 1930	0	0	0	0	0	0
St. Paul, Minn	Municipal Air Field [4]		June 4, 1928	[2]					
St. Thomas, V. I	St. Thomas Airport [3]	3/10		53	53	419	419	0	0
San Diego, Calif	Lindbergh Field		Jan. 24, 1930	1,763	1	6,131	1	0	0
San Juan, P. R	Isle Grande								
	Alhambra Western Airport Express Field	12	Jan. 19, 1930	223	213	1,949	1,859	332	3
Sandusky, Ohio	Parker Field		June 6, 1932	[2]					
Scobey, Mont	Scobey Airport		June 2, 1930	3	3	7	7	3	0
Seattle, Wash	Boeing Field		Sept. 11, 1928						
	Lake Union		Dec. 27, 1928	303	0	666	0	0	0
Skagway, Alaska	Skagway Municipal Airport		Nov. 30, 1931						
	Skagway Seaplane Base		do						
Spokane, Wash	Felts Field [1]		June 2, 1930	[2]					
Swanton, Vt	Missisquoi Airport [1]		July 18, 1930	[2]					
Watertown, N. Y	Western Municipal Airport [1]		June 2, 1930	[2]					
West Palm Beach, Fla	Roosevelt Service Flying Base (Currie Common Park). [1]		Mar. 10, 1931	128	128	581	581	47	0
Wrangell, Alaska	Wrangell Seaplane Base		Nov. 30, 1931						
Total				4,401	2,205	24,694	17,387	2,860	25

[1] Temporary permission.
[2] No medical officer of Public Health Service.
[3] Authorized for use but not officially designated.
[4] Closed Dec. 31, 1931.

MEXICAN BORDER STATIONS

TABLE 4.—*Summary of quarantine transactions on the Mexican border for fiscal year 1932*

Station	Number inspected from interior Mexico	Number of local passengers inspected	Total number of passengers inspected	Total number of persons disinfested	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.	2,124	836,953	839,077	70	837,520	1,033	0	0	0
Calexico, Calif.	0	9,886	9,886	0	9,330	697	0	156	0
Columbus, N. Mex.	0	865	865	0	558	296	0	11	0
Del Rio, Tex.	1,346	89,696	91,042	848	89,311	887	0	3	629
Douglas, Ariz.	1,908	3,206	5,114	0	0	444	0	0	0
Eagle Pass, Tex.	3,943	701,624	705,567	13,270	78,249	1,638	0	45	14,132
El Paso, Tex.[1]	8,579	5,070,554	5,079,133	22,322	5,048,676	8,128	0	7	1,368
Guadalupe Gate, Tex.	0	161	161	0	0	86	0	0	0
Hidalgo, Tex.	2,315	262,059	264,374	74	262,595	1,698	7	0	6
Laredo, Tex.	53,577	1,497,402	1,550,979	1,746	1,538,464	12,515	199	0	1,976
Minerva, Tex.	0	1,920	1,920	0	1,649	293	0	2	0
Naco, Ariz.	2	3,476	3,478	0	2,301	997	0	181	0
Nogales, Ariz.	4,079	17,212	21,291	5	20,507	779	0	0	4
Presidio, Tex.	101	41,420	41,521	167	40,585	751	5	13	386
Rio Grande, Tex.	374	13,504	13,878	0	13,249	629	0	0	923
Roma, Tex.	4,792	40,082	44,874	2	42,886	1,986	0	0	17
San Ysidro, Calif.	4,176	11,859	16,035	0	13,802	1,872	0	361	0
Sasabe, Ariz.	1	491	492	0	291	200	0	1	0
Thayer (Mercedes), Tex.	35	73,331	73,366	9	72,929	428	0	0	7
Yseleta, Tex.	0	109,405	109,405	0	109,170	235	0	0	0
Zapata, Tex.	800	13,492	14,292	17	12,473	1,819	1	0	0
Total	88,152	8,798,598	8,886,750	38,530	8,194,545	37,411	212	780	19,448

[1] Includes the subports Newmans School and Fort Hancock.

TRANSACTIONS AT INSULAR QUARANTINE STATIONS

TABLE 5.—*Summary of transactions at insular stations for fiscal year 1932*

Station	Vessels inspected	Vessels fumigated		Passengers inspected	Crews inspected	Bills of health and port sanitary statements issued
		Cyanide	Sulphur			
Alaska:						
Cordova						
Juneau						
Ketchikan						
Seward						
Sitka						
Wrangell						
Total	0	0	0	0	0	0
Hawaii:						
Ahukini						40
Hilo	9			2	413	206
Honolulu	153	14		30,766	28,119	702
Kahului	1				36	154
Kihei						
Koloa	1				32	77
Lahaina	1				36	65
Mahukona						
Makaweli						
Total	165	14	0	30,768	28,636	7,544
Philippines:						
Cavite	7			120	2,185	2
Cebu	85		110	689	4,821	341
Davao	40			493	3,182	150
Iloilo	102		207	245	4,598	209
Jolo	27			396	915	63

TABLE 5.—*Summary of transactions at insular stations for fiscal year 1932*—Con.

Station	Vessels inspected	Vessels fumigated		Passengers inspected	Crews inspected	Bills of health and port sanitary statements issued
		Cyanide	Sulphur			
Philippines—Continued.						
Legaspi	13			1	580	59
Manila	1,056	72	168	74,798	104,983	1,219
Olongapo	1				63	
Zamboanga	14		15	508	1,123	78
Total	1,345	72	500	77,250	122,450	2,121
Puerto Rico:						
Aguadilla	1				8	113
Arecelbo	1				28	45
Arroyo	5			1	106	49
Central Aguirre						38
Fajardo	43			3	204	348
Guanica	197		1	530	10,560	56
Humacao	10				71	30
Mayaguez	28			30	337	158
Ponce	52	1		23	989	93
San Juan	507	24		10,401	29,232	865
Total	844	25	1	10,988	41,535	1,795
Virgin Islands:						
Christiansted	12			31	114	195
Frederiksted	56			1,971	5,248	76
St. Johns						
St. Thomas	197	7	7	1,609	7,163	523
Total	265	7	7	3,611	12,525	794
Total, all stations	2,619	118	508	122,617	205,146	12,254

TRANSACTIONS AT FOREIGN PORTS

TABLE 6.—*Summary of transactions at foreign ports, fiscal year 1932*

Station	Vessels inspected	Fumigation of vessels supervised	Passengers and crews inspected		Bills of health countersigned
			Passengers	Crews	
Amoy, China	84	0	16,566	9,007	92
Guantanamo Bay, Cuba	121	0	0	0	121
Guayaquil, Ecuador	0	0	0	0	139
Habana, Cuba	0	43	0	0	1,530
Hong Kong in China	535	0	61,317	86,317	666
Mexico City, Mexico	0	0	0	0	0
Progreso, Mexico	212	0	559	11,088	212
Shanghai, China	425	59	8,734	4,200	800
Tampico, Mexico	393	12	218	14,919	393
Vera Cruz, Mexico	131	1	6,469	19,395	231
Puerto Mexico, Mexico	0	3	7	0	74
Total	1,901	118	93,870	144,926	4,258
EUROPEAN PORTS					
Antwerp, Belgium	18	0	2,979	0	767
Belfast, Ireland	0	0	1,614	0	87
Bremen, Germany	0	111	10,377	0	539
Cobh, Irish Free State	0	0	5,889	0	107
Copenhagen, Denmark	0	0	1,153	0	172
Danzig Free City	63	0	3,361	2,339	10
Dublin, Ireland	0	0	77	0	56
Genoa, Italy	41	35	3,706	0	315
Glasgow and Greenock, Scotland	0	0	3,058	0	267
Londonderry, England [1]	0	0	116	0	4

[1] Discontinued July 31, 1932.

TABLE 6.—*Summary of transactions at foreign ports, fiscal year 1932*—Continued

Station	Vessels inspected	Fumigation of vessels supervised	Passengers and crews inspected		Bills of health countersigned
			Passengers	Crews	
EUROPEAN PORTS—continued					
Bergen, Norway	0	0	905	0	7
Goteborg, Sweden	0	0	311	0	0
Hamburg, Germany	0	150	15,752	18	834
Liverpool, England	0	0	9,951	0	387
London, England	3	0	480	0	454
Marseilles, France [2]	0	1	0	0	46
Naples, Italy	126	0	23,019	11,984	257
Oslo, Norway	0	0	0	0	85
Palermo, Italy	0	0	373	0	69
Piraeus, Italy (Athens)	18	0	1,826	1,494	22
Rotterdam, Holland	0	0	2,570	0	503
Southampton, England	3	0	19,946	0	404
Stockholm, Sweden	0	0	230	0	0
Total	272	297	107,693	15,835	5,392
Total, all stations	2,173	415	201,563	160,761	9,650

[2] Opened Mar. 31, 1932.

TABLE 7.—*Primary treatment of passengers and crew prior to embarkation, fiscal year 1932*

Name of port	Passengers inspected	Crew inspected	Passengers vaccinated	Crew vaccinated	Passengers deloused	Crew deloused	Passengers detained	Passengers rejected
Antwerp	2,979	0	0	0	19	0	92	0
Belfast	1,614	0	0	0	74	0	0	1
Bergen	905	0	0	0	0	0	0	0
Bremen	10,377	0	0	0	679	0	11	0
Cobh	5,889	0	0	0	584	0	0	0
Copenhagen	1,153	0	0	0	0	0	0	0
Danzig	3,361	2,339	0	0	1,547	244	0	0
Dublin	77	0	0	0	2	0	0	0
Genoa	3,706	0	1,519	0	18	0	34	0
Glasgow	3,058	0	0	0	0	0	0	0
Goteborg	311	0	0	0	0	0	0	0
Hamburg	15,752	18	26	0	181	0	21	0
Liverpool	9,951	0	31	0	60	0	0	0
London	480	0	0	0	0	0	0	0
Londonderry [1]	116	0	0	0	11	0	0	0
Naples	23,019	11,984	23,019	0	5,310	0	0	0
Oslo	0	0	0	0	0	0	0	0
Palermo	373	0	293	0	107	0	0	1
Piraeus	1,826	1,494	1,676	610	1,393	0	306	32
Rotterdam	2,570	0	0	0	196	0	0	0
Southampton	19,946	0	0	0	9	0	9	0
Stockholm	230	0	0	0	0	0	0	0
Marseilles [2]	0	0	0	0	0	0	0	0
Total	107,693	15,835	26,564	610	10,190	244	473	34

[1] Discontinued July 31, 1931.

[2] Began reporting April, 1932.

TABLE 8.—*Treatment of passengers coming from other points for embarkation (transmigrants), fiscal year 1932*

Treatment	Copenhagen	Liverpool	Southampton	Total
Passengers inspected	810	61	97	963
Passengers vaccinated	0	0	0	0
Passengers deloused	0	0	9	9
Passengers detained	0	0	0	0
Passengers rejected	0	0	0	0
Baggage disinfected and passed	0	0	0	0
Baggage inspected and passed	0	0	56	56

TABLE 9.—*Primary treatment of passengers proceeding to another port for embarkation, fiscal year 1932*

Treatment	Class	Antwerp	Danzig	Hamburg	Total
Total transmigrants	Second	0	30	1	31
	Third	19	427	39	485
Passengers vaccinated	Second	0	0	0	0
	Third	0	0	4	4
Passengers deloused and passed	Second	0	6	0	6
	Third	19	243	13	275
Passengers inspected and passed without delousing	Second	0	24	1	25
	Third	0	184	26	210
Baggage disinfected and passed	Second	0	6	0	6
	Third	9	199	26	234
Baggage inspected and passed	Second	0	0	0	0
	Third	3	0	34	37
COUNTRIES OF DEPARTURE					
Danzig			5		5
Estonia				1	1
Latvia			10		10
Lithuania			185	17	202
Poland		19	256		275
Rumania			1	13	14
Russia				9	9

TABLE 10.—*Treatment of baggage, vessels and service beneficiaries, fiscal year 1932*

Name of port	Baggage disinfected and passed	Baggage inspected and passed	Vessels inspected	Vessels fumigated	Bills of health countersigned	Medical examination of service beneficiaries
Antwerp	39	36	18	0	767	3
Belfast	12	136	0	0	87	3
Bergen	0	0	0	0	7	3
Bremen	115	927	0	111	539	0
Cobh	170	2,312	0	0	107	4
Copenhagen	0	0	0	0	172	9
Danzig	1,556	0	63	0	10	1
Dublin	0	0	0	0	56	27
Genoa	5	47	41	35	315	3
Glasgow	0	0	0	0	267	4
Goteborg	0	0	0	0	0	7
Hamburg	322	17,276	0	150	834	3
Liverpool	0	0	0	0	387	3
London	0	0	3	0	454	27
Londonderry [1]	0	57	0	0	4	0
Marseilles [2]	0	0	0	1	46	1
Naples	20,808	18,728	126	0	257	124
Oslo	0	0	0	0	85	7
Palermo	159	339	0	0	69	0
Piraeus	1,203	509	18	0	22	5
Rotterdam	100	1,103	0	0	503	0
Southampton	0	0	3	0	404	12
Stockholm	0	0	0	0	0	0
Total	24,489	41,470	272	297	5,392	246

[1] Discontinued July 31, 1931.

[2] Started reporting Apr. 1, 1932.

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 1932*

Station	Vessels inspected	Vessels fumigated	Passengers inspected	Crew inspected	Bills of health and port sanitary statements issued
Continental	13,256	1,414	[1] 718,596	998,471	39,707
Insular	2,619	626	122,617	205,146	12,254
Foreign	2,173	415	201,563	160,761	9,650
Total	18,048	2,455	1,042,776	1,364,378	61,611

[1] Maritime stations 630,444; border stations, 88,152; statistics do not include "local" travelers at border stations, numbering 8,798,598 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 373,034 alien passengers for the purpose of detecting physical or mental defects or diseases, as provided by the United States immigration laws. In addition, 897,788 alien seamen were inspected during the fiscal year ended June 30, 1932, as provided for in the act of February 5, 1917.

During the year Public Health Service procedure at United States ports was modified with respect to the certification by medical officers of the detectability of conditions making aliens inadmissible into the United States by competent medical examination performed at time of embarkation or employment on board. This modification was the result of a joint conference between representatives of the Bureau of Immigration and the Public Health Service to bring the practice into accord with recent court decisions interpreting the immigration laws, and it is anticipated that the new procedure will serve greatly to reduce potential litigation based upon such cases.

As a result of an amendment to the immigration rules and regulations of the Department of Labor, following a conference between that department and the Public Health Service, paragraphs 2 and 3 of the Regulations Governing the Medical Examination of Aliens, revised August, 1930, were amended. The amendment of these paragraphs represents no change in policy, but merely a technical change in phraseology regarded to be necessary in order to be correlated properly with the new language resulting from the amendment to the immigration rules and regulations of the Department of Labor. Similarly, in response to a request made by the Secretary of State, paragraphs 97 and 98 of these regulations were also amended. This also represents no change in policy, but only a change in technical phraseology in order that these regulations may conform to the consular regulations relating to the same subject, and to certain provisions of an interdepartmental agreement between the State, Labor, and Treasury Departments.

144391—32——8

TABLE 12.—*Alien passengers and seamen inspected and certified at maritime ports in the United States and possessions during the fiscal year 1932*

Place	Alien passengers certified [1]						Alien seamen certified [1]					
	Number of alien passengers examined	Class A		Class B	Class C	Total	Number of alien seamen examined	Class A		Class B	Class C	Total
		I	II					I	II			
ATLANTIC COAST												
Baltimore, Md	122			1		1	15,134		37	21		58
Beaufort, S. C	0					0	0					0
Boston, Mass	3,957	1	2	125	5	133	56,950		26	221		247
Brunswick, Ga	0					0	0					0
Charleston, S. C	46					0	2,805		4			4
Fall River, Mass	0					0	1,620		1			1
Fernandina, Fla	0					0	92					0
Fort Monroe, Va.[2]	195					0	8,868		36	2		38
Fort Pierce, Fla	0					0	0					0
Georgetown, S. C	0					0	0					0
Gloucester, Mass	0					0	110			1	1	2
Jacksonville, Fla	40		1			1	1,977		4			4
Key West, Fla	4,527		1	17		18	2,122					0
Lewes, Del	0					0	0					0
Miami, Fla	2,922	1		4	6	11	7,831		1		1	2
New Bedford, Mass	73			2		2	133		4		1	5
New London, Conn	0					0	0					0
Newport, R. I	0					0	0					0
New York, N. Y. (Ellis Island)	131,165	22	31	4,683	67	4,803	496,113	9	248	11	3	271
Perth Amboy, N. J	1					0	2,271	1	1	2		4
Philadelphia, Pa	231					0	19,348		27			27
Plymouth, Mass	0					0	0					0
Port Everglades, Fla	0					0	0					0
Portland, Me	68					0	3,909		2	1		3
Providence, R. I	762		1	38	2	41	2,80		1			1
Savannah, Ga	68					0	2,210		10	1	1	12
Searsport, Me	0					0	0		0			0
Vineyard Haven, Mass	0					0	16					0
Washington, N. C	0					0	0					0
West Palm Beach, Fla	37					0	171					0
Wilmington, N. C	71					0	932			1		1
Total	•144,285	24	36	4,870	80	5,010	625,592	10	402	261	7	680
GULF COAST												
Boca Grande, Fla	0					0	397					0
Carabelle, Fla	0					0	0					0

Cedar Keys, Fla	0					0	0					0
Corpus Christi, Tex	15					0	872					0
Freeport, Tex	0					0	0					0
Galveston, Tex	200					0	16, 030		40			40
Gulfport, Miss	0					0	0					0
Mobile, Ala	78					0	4, 259	1	5			6
Morgan City, La. (Atchafalaya)	0					0	0					0
New Orleans, La	2, 394		7	33	9	49	28, 365	7	119	76	108	310
Panama City, Fla	0					0	47					0
Pascagoula, Miss	0					0	0					0
Pensacola, Fla	8					0	885	1	4			5
Port Aransas, Tex	0					0	0					0
Port St. Joe, Fla	0					0	0					0
Sabine, Tex	19			1		1	4, 234		8	3		11
Tampa, Fla	115					0	2, 683	1	4		1	6
						0						
						0						
Total	2, 829	0	7	34	9	50	57, 772	10	180	79	109	378
PACIFIC COAST												
Aberdeen, Wash	0					0	294					0
Angel Island, Calif. (San Francisco)	4, 996		26	156	107	289	642		16		3	19
Astoria, Oreg	0					0	1, 752		2	1		3
Eureka, Calif	0					0	0					0
Fort Bragg, Calif	0					0	0					0
Marshfield, Oreg. (Coos Bay)	0					0	246					0
Monterey, Calif	0					0	0					0
Newport, Oreg	0					0	0					0
Portland, Oreg	4			2		2	571		1	1		2
San Diego, Calif	530	1	6	1		8	5, 285			1		1
San Luis Obispo, Calif	0					0	860					0
San Pedro, Calif	6, 185		4	44	15	63	45, 351		64	11	10	85
Santa Barbara, Calif	0					0	0					0
Seattle, Wash.[3]	2, 186	11	14	45	138	208	6, 772		1	2	6	9
South Bend, Wash	0					0	0					0
Total	13, 901	12	50	248	260	570	61, 77?	0	84	16	19	119
INSULAR												
Alaska: Ketchikan	0					0	0					0
Hawaii: Honolulu	3, 421	1	10	54	14	79	24, 400		20	2		22
Philippines:												
Cebu	420					0	4, 054					0
Davao	11					0	2, 783					0
Iloilo	104					0	3, 482					0
Jolo	259					0	775					0
Legaspi	1					0	433					0

[1] Class A–I: Aliens certified for idiocy, imbecility, feeble-mindedness, insanity, epilepsy, chronic alcoholism. Class A–II: Aliens certified for tuberculosis or other loathsome or dangerous contagious diseases. Class B: Aliens certified for diseases or defects which affect ability to earn a living. Class C: Aliens certified for diseases or defects of less degree.

[2] Embraces Norfolk, Va., and Newport News, Va.

[3] Embraces all ports on Puget Sound.

TABLE 12.—*Alien passengers and seamen inspected and certified at maritime ports in the United States and possessions during the fiscal year 1932*—Continued

Place	Alien passengers certified [1]						Alien seamen certified [1]					
	Number of alien passengers examined	Class A		Class B	Class C	Total	Number of alien seamen examined	Class A		Class B	Class C	Total
		I	II					I	II			
INSULAR—continued												
Philippines—Continued.												
Manila	22,946		30	80	24	134	76,153					0
Zamboanga	319					0	1,002					0
Total	24,060	0	30	80	24	134	88,682	0	0	0	0	0
Puerto Rico:												
Aguadalla	0					0	4					0
Arecibo	0					0	28					0
Arroyo	1					0	106					0
Central Aguirre (Jobos)	0					0	0					0
Fajardo	56					0	153					0
Gaunica	15					0	6,650		2	1		3
Humacao	0					0	57					0
Mayaguez	22					0	225					0
Ponce	6					0	849		4			4
San Juan	7,142			3		3	17,007					0
Total	7,242	0	0	3	0	3	25,079	0	6	1	0	7
CANADIAN BORDER												
Blaine, Wash	0					0	0					0
Bellingham, Wash	0					0	330					0
Buffalo, N. Y	0					0	12,936	4	1	151		156
Calais, Me	0					0	0					0
Detroit, Mich	0					0	0					0
Duluth, Minn	0					0	14					0
Eastport, Me	0					0	712					0
Erie, Pa	0					0	160					0
Lewiston, N. Y	0					0	131				4	4
Ogdensburg, N. Y	0					0	207			1		1
Port Huron, Mich	0					0	0					0
Sault Ste. Marie, Mich	0					0	0					0
Total						0	14,490	4	1	152	4	161
Total, all stations	195,738	37	133	5,289	387	5,846	897,788	24	693	511	139	1,367

[1] Class A–I: Aliens certified for idiocy, imbecility, feeble-mindedness, insanity, epilepsy, chronic alcoholism. Class A–II: Aliens certified for tuberculosis or other loathsome or dangerous contagious diseases. Class B: Aliens certified for diseases or defects which affect ability to earn a living. Class C: Aliens certified for diseases or defects of less degree,

TABLE 13.—*Alien passengers inspected and certified at international border stations, fiscal year, 1932*

Place	Number persons making permanent entry examined	Number persons making temporary entry examined	Alien passengers certified [1]				Total
			Class A		Class B	Class C	
			I	II			
MEXICAN BORDER							
Ajo, Ariz	0	142					0
Brownsville, Tex	2,421	10,545	7	22	262	94	385
Calexico, Calif	152	9,734	1	143	11	32	187
Columbus, N. Mex	0	865		3	8		11
Del Rio, Tex	25	4,461	1		2		3
Douglas, Ariz	1,908	3,206	7	37	10	54	108
Eagle Pass, Tex	236	2,854	4		12	17	33
El Paso, Tex	1,321	12,066	47	197	1,525	260	2,029
Guadaloupe Gate, Tex	0	161			3		3
Hidalgo, Tex	462	1,846	3	45	146	303	497
Laredo, Tex	20,565	12,384	5	90	256	14	365
Naco, Ariz	10	3,469	20	95	82	61	258
Nogales, Ariz	3,647	13,577	4	47	358	99	508
Presidio, Tex	2	999	2	8	20	119	149
Rio Grande, Tex	1	832	1	15	1	4	21
Roma, Tex	5	453	1	3	14	52	70
San Ysidro, Calif	608	15,427	7	124	795	34	960
Sasaba, Ariz	2	490			1	3	4
Thayer, Tex	9	510		24	8	11	43
Tucson, Ariz	0	515	28	97	40	6	171
Ysleta, Tex	0	71				1	1
Zapata, Tex	197	356			6	1	7
Total	31,571	94,963	138	950	3,560	1,165	5,813
CANADIAN BORDER							
Bellingham, Wash	0	0					0
Blaine, Wash	454	514	10	4	33	39	86
Buffalo, N. Y	105	502	10	8	75	1	94
Calais, Me	145	0	3	3	12	5	23
Detroit, Mich	1,591	2,689	41	36	570	73	720
Duluth, Minn	0	4,094			1	2	3
Eastport, Idaho	111	180	1	4	24	14	43
Eastport, Me	0	5,495			1		1
Erie, Pa	0	0					0
Halifax, Nova Scotia, Canada	489	498	5	5	117	183	310
Havre, Mont	0	0					0
Houlton, Me	279	2	3	2	1		6
International Falls, Minn	240	175	3		21		24
Jackman, Me	76	106	3	1	22	64	90
Lewiston, N. Y	221	19,149	6		20	14	40
Malone, N. Y	11	37	4	6		7	17
Montreal, Canada	1,012	0	17	29	158	51	255
Newport, Vt	456	687	7	4	57	21	89
Niagara Falls, N. Y	211	1,361	8	3	69	10	90
Northport, Wash	0	56	1	1	2	0	4
Noyes, Minn	22	44	5	2	17	3	27
Ogdensburg, N. Y	11	5			2	1	3
Oroville, Wash	4	16					0
Portal, N. Dak	3	34	2	1	9	2	14
Port Huron, Mich	161	612	12	9	111	35	167
Quebec, Canada	698	1,312	4		134	36	174
Rouses Point, N. Y	724	0	8	10	41	3	62
St. Albans, Vt	18	67	1	2	10	3	16
St. Johns, New Brunswick, Canada	225	366	2	2	39	21	64
Saulte Ste. Marie, Mich	25	0	3		2		5
Scobey, Mont	0	4					0
Sumas, Wash	92	328	5	4	7	13	29
Sweetgrass, Mont	109	652	1				1
Van Buren, Me	9	3			1		1
Vanceboro, Me	367	490	1	8	2		11
Vancouver, Canada	0	393	10	6	95	5	116
Victoria, Canada	213	0	5	4	15	16	40
Winnipeg, Manitoba, Canada	508	2,162	8	7	626	139	780
Yarmouth, Nova Scotia, Canada	0	139	8	3	33	7	51
Total	8,590	42,172	197	164	2,327	768	3,456
Total all stations	40,161	137,135	335	1,114	5,887	1,933	9,269

[1] Class A-I: Aliens certified for idiocy, imbecility, feeble-mindedness, insanity, epilepsy, chronic alcoholism. Class A-II: Aliens certified for tuberculosis or other loathsome or dangerous contagious diseases. Class B: Aliens certified for diseases or defects which affect ability to earn a living. Class C: Aliens certified for diseases or defects of less degree.

TABLE 14.—*Number and character of the more serious mandatorily excludable conditions certified at United States ports, fiscal year, 1932*

	Idiocy, imbecility, feeble-minded	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	Other dangerous or loathsome contagious diseases	Total
Alien passengers	96	40	85	118	27	119	346	48	273	31	394	42	1,619
Alien seamen	7	2	7	1	6	7	39	4	146	162	332	4	717
Total	103	42	92	119	33	126	385	52	419	193	726	46	2,336

TABLE 15.—*Summary of medical inspection of aliens, fiscal year 1932*

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	54,861	910	54,587	7	19	216	32	274
Second	29,656	1,372	29,281	12	15	233	115	375
Third	96,414	7,591	94,796	16	87	1,292	223	1,618
Stowaways	597	267	573	0	12	7	5	24
Total	181,528	10,140	179,237	35	133	1,748	375	2,291

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	1,874	160	1,697	1,695	171	6	177	1	------	1	----	2	179
Second	3,591	27	2,569	2,569	1,022	0	1,022	----	------	----	----	------	1,022
Third	8,745	110	6,392	6,391	2,347	6	2,353	1	------	----	----	1	2,354
Total	14,210	297	10,658	10,655	3,540	12	3,552	2	0	1	0	3	3,555

GROUP III.—ALIEN SEAMEN EXAMINED ON ARRIVAL

	Total examined	Intensively examined	Passed	Certified				Total certified
				A-I	A-II	B	C	
Alien crew	883,229	277,863	882,026	20	692	358	133	1,203
Workaways	69	31	66	------	------	1	2	3
Total	883,298	277,894	882,092	20	692	359	135	1,206

TABLE 16.—*Summary of medical inspection of aliens, fiscal year 1932*

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)	39,579	33,235	37,455	126	223	1,287	488	2,124
Statistical, making temporary entry	23,822	6,293	21,981	61	140	1,362	278	1,841
Nonstatistical, making entry (local crossers, etc.)	112,073	54,016	106,846	146	747	3,171	1,163	5,227
Total	175,474	93,544	166,282	1,333	1,110	5,820	1,929	9,192

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
					A–I	A–II	B	C	Number certified	A–I	A–II	B	C	Number certified	
Statistical, making permanent entry (bona fide immigrants)	582	581	539	531	----	-----	42	1	43	1	1	5	1	8	51
Statistical, making temporary entry	1,232	1,232	1,219	1,212	----	-----	13	---	13	----	-----	7	---	7	20
Nonstatistical, making entry (local crossers, etc.)	8	8	6	2	----	1	----	1	2	1	2	---	1	4	6
Total	1,822	1,821	1,764	1,745	----	1	55	2	58	2	3	12	2	19	77

GROUP III.—ALIEN SEAMEN EXAMINED ON ARRIVAL

	Total examined	Intensively examined	Passed	Certified				Total certified
				A–I	A–II	B	C	
Alien crew	14,490	14,000	14,329	4	1	152	4	161
Workaways	0	0	0	-------	-------	-------	-------	0
Total	14,490	14,000	14,329	4	1	152	4	161

EXAMINATION OF PROSPECTIVE IMMIGRANTS ABROAD

Owing to the economic conditions prevailing in the United States, the number of immigration visas granted during the year to prospective immigrants abroad was greatly reduced. It has been reported that the number of immigrants granted visas averaged about 10 per cent of the quota for each country, thus representing a very material reduction in the amount of work required. Because of this fact it was possible to curtail the number of personnel engaged in the performance of the medical examination of aliens in foreign ports. This was possible in some instances through the expedient of having one medical officer take care of the medical examinations at two or more near-by ports, the medical officer having his headquarters at the most important of the ports under his jurisdiction and having travel status from consulate to consulate, notification being issued to intending immigrants to appear for definite periods in each month at each respective consulate for medical examination.

There were 42,831 applicants for immigration visas examined by medical officers in foreign countries. Of this number 26,560 were

examined by medical officers of the Public Health Service attached to American consulates in Europe; the remainder, 16,271 were examined by medical officers of the service attached to American consulates in the Western Hemisphere. Of the number examined in Europe, 851 were reported by these officers to the American consuls as afflicted with one or more of the diseases listed in class A as mandatorily excludable, while 6,278 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 number examined by medical officers of the Public Health Service in their countries of origin in the Western Hemisphere, 162 were reported to consular officers as afflicted with one or more of the diseases listed under class A as mandatorily excludable, and 1,788 were reported as afflicted with a disease or condition listed in class B as liable to affect their ability to earn a living.

Of 38,375 aliens who had been given a preliminary medical examination in foreign countries and to whom visas had been issued, only 7 were certified upon arrival at a United States port as being afflicted with class A disease, resulting in mandatory deportation.

TABLE 17.—*Distribution, according to class, of applicants for immigration visas who were medically examined during the fiscal year 1932*

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
WESTERN HEMISPHERE							
Cuba: Habana	1,182	462	695	25	39.1	58.8	2.1
Mexico: Mexico City	679	167	512	0	24.6	75.4	0
Canada:							
Hamilton	785	250	377	158	31.8	48.0	20.1
Montreal	4,269	935	2,195	1,139	21.9	51.4	26.7
Ottawa	460	130	330	0	28.3	71.7	0
Quebec	2,482	135	573	1,774	5.5	23.0	71.5
Toronto	1,934	867	1,048	19	44.8	54.2	1.0
Vancouver	772	235	537	0	30.5	69.5	0
Windsor	1,907	607	1,300	0	31.4	68.6	0
Winnipeg	1,397	276	691	430	19.7	49.4	31.5
Yarmouth	404	15	388	1	3.7	96.0	.2
All Canadian	14,410	3,450	7,439	3,521	23.9	51.6	24.4
All countries, Western Hemisphere	16,271	4,079	8,646	3,546	25.1	53.1	21.8
EUROPE							
Belgium: Antwerp	393	243	150	0	61.8	38.2	0
England, total	2,992	1,952	1,039	1	65.2	34.7	.1
Liverpool	1,087	776	310	1	71.4	28.5	.1
London	1,548	945	603	0	61.0	39.0	0
Southampton	357	231	126	0	64.7	35.3	0
Irish Free State, total	1,041	780	246	15	75.0	23.6	1.4
Cobh	448	355	93	0	79.2	20.8	0
Dublin	593	425	153	15	71.7	25.8	2.5
Northern Ireland: Belfast	380	287	88	5	75.5	23.2	1.3
Scotland: Glasgow	1,439	968	468	3	67.3	32.5	.2
Germany, total	4,782	3,496	1,277	9	73.1	26.7	.2
Berlin	1,689	1,197	492	0	70.9	29.1	0
Bremen	505	351	154	0	69.5	30.5	0
Cologne	942	736	200	6	78.1	21.3	.6
Hamburg	569	341	226	2	59.9	39.8	.3
Stuttgart	1,077	871	205	1	80.9	19.0	.1

TABLE 17.—*Distribution, according to class, of applicants for immigration visas who were medically examined during the fiscal year 1932*—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
EUROPE—continued							
Holland: Rotterdam	558	420	109	29	75.3	19.5	5.2
Poland: Warsaw	2,458	1,458	1,000	0	59.3	40.7	0
Denmark: Copenhagen	539	389	150	0	72.2	27.8	0
Norway, total	636	418	218	0	65.7	34.3	0
Bergen	129	72	57	0	55.8	44.2	0
Oslo	507	346	161	0	68.2	31.8	0
Sweden, total	541	341	200	0	63.0	37.0	0
Goteborg	311	179	132	0	57.5	42.5	0
Stockholm	230	162	68	0	70.4	29.6	0
Italy, total	9,741	3,117	6,624	0	32.0	68.0	0
Genoa	1,834	660	1,174	0	36.0	64.0	0
Naples	5,621	1,663	3,958	0	29.6	70.4	0
Palermo	2,286	794	1,492	0	34.7	65.3	0
Czechoslovakia: Prague	689	314	375	0	45.6	54.4	0
Austria: Vienna	371	213	158	0	57.4	42.6	0
All European countries	26,560	14,396	12,102	62	54.2	45.6	.2

TABLE 18.—*Distribution according to sex of applicants for immigration visas who were medically examined during the fiscal year 1932*

Country and consular office	Number of each sex examined		Per cent of each sex examined	
	Male	Female	Male	Female
WESTERN HEMISPHERE				
Cuba: Habana	700	482	59.2	40.8
Mexico: Mexico City	375	304	55.2	44.8
Canada:				
Hamilton	434	351	55.3	44.7
Montreal	2,347	1,922	55.0	45.0
Ottawa	226	234	49.1	50.9
Quebec	972	1,510	39.1	60.9
Toronto	943	991	48.8	51.2
Vancouver	383	389	49.0	51.0
Windsor	860	1,047	45.0	55.0
Winnipeg	731	666	52.4	47.6
Yarmouth	159	245	39.3	60.6
All Canadian	7,055	7,355	49.0	51.0
All countries, Western Hemisphere	8,130	8,141	50.0	50.0
EUROPE				
Belgium: Antwerp	210	183	53.4	46.6
England:				
Liverpool	457	630	42.0	58.0
London	693	855	44.7	55.3
Southampton	169	188	47.3	57.2
Irish Free State:				
Cobh	150	298	33.5	66.5
Dublin	189	404	31.9	68.1
Northern Ireland: Belfast	134	246	35.2	64.8
Scotland: Glasgow	600	839	41.7	58.3
Germany:				
Berlin	738	951	43.7	56.3
Bremen	217	288	42.9	57.1
Cologne	357	585	37.9	62.1
Hamburg	260	309	45.7	54.3
Stuttgart	314	763	29.1	70.9

TABLE 18.—*Distribution according to sex of applicants for immigration visas who were medically examined during the fiscal year 1932*—Continued

Country and consular office	Number of each sex examined		Per cent of each sex examined	
	Male	Female	Male	Female
EUROPE—continued				
Holland: Rotterdam	255	303	45.7	54.3
Poland: Warsaw	1,150	1,308	46.8	53.2
Denmark: Copenhagen	268	271	49.7	50.3
Norway:				
Bergen	67	62	51.9	48.1
Oslo	223	284	44.0	56.0
Sweden:				
Goteborg	145	166	46.6	53.4
Stockholm	97	133	42.1	57.9
Italy:				
Genoa	650	1,184	35.4	64.6
Naples	2,361	3,260	42.0	58.0
Palermo	925	1,361	40.5	59.5
Czechoslovakia: Prague	279	410	40.6	59.4
Austria: Vienna	159	212	42.8	57.2
All European countries	11,067	15,493	41.7	58.3

TABLE 19.—*Number and percentage of applicants medically examined who were notified for different classes of disabilities, and percentage distribution of male and female applicants according to class of disability, during the fiscal year 1932*

Country and consular office	Number notified for—		Per cent of applicants examined notified for—		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	Class A conditions	Class B conditions
WESTERN HEMISPHERE								
Cuba: Habana	69	111	5.8	9.4	4.5	11.1	7.7	6.9
Mexico: Mexico City	5	38	.7	5.6	1.6	6.1	.3	4.9
Canada:								
Hamilton	6	117	.8	14.9	1.2	16.1	.3	13.4
Montreal	14	577	.3	13.5	.3	15.5	.3	16.2
Ottawa	5	61	1.0	13.3	1.3	11.0	.8	15.4
Quebec	5	121	.2	4.9	.1	2.1	.1	2.8
Toronto	29	149	1.5	7.7	.9	3.1	.6	4.6
Vancouver	4	77	.5	.9	2.4	55.5	2.4	39.6
Windsor	17	363	.8	19.0	.9	17.2	.9	21.5
Winnipeg	7	87	.5	6.3	.9	5.7	0	6.7
Yarmouth	1	87	.2	21.5	0	14.4	.4	26.1
All Canadian	88	1,639	.6	11.3	1.2	23.2	1.2	22.3
All countries, Western Hemisphere	162	1,788	1.0	11.0	2.0	25.3	2.2	22.0
EUROPE								
Belgium: Antwerp	3	90	.8	22.9	1.4	20.9	0	25.1
England:								
Liverpool	22	301	2.0	27.7	2.8	27.8	1.4	27.6
London	1	285	.1	15.2	.1	15.4	0	14.9
Southampton	9	66	2.5	18.5	2.3	20.7	2.6	16.5
Irish Free State:								
Cobh	3	107	.7	23.8	1.3	14.0	.3	28.8
Dublin	3	169	.5	28.5	0	29.1	.7	28.2
Northern Ireland: Belfast	4	84	1.0	22.1	.7	20.1	1.2	23.1
Scotland: Glasgow	2	295	.1	20.5	0	28.0	.2	15.1

TABLE 19.—*Number and Percentage of applicants medically examined who were notified for different classes of disabilities, and percentage distribution of male and female applicants according to class of disability, during the fiscal year 1932*—Continued

County and consular office	Number notified for—		Per cent of applicants examined notified for—		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	Class A conditions	Class B conditions
EUROPE—continued								
Germany:								
Berlin	18	517	1.0	30.6	1.1	32.2	1.0	29.3
Bremen	5	83	1.0	16.4	1.4	11.5	.7	20.1
Cologne	11	135	1.1	14.3	.8	13.4	1.3	14.9
Hamburg	3	63	.5	11.1	.4	9.6	.6	12.3
Stuttgart	9	175	.8	16.3	.9	15.3	.8	16.6
Holland: Rotterdam	5	106	.9	18.9	.4	18.4	1.3	19.4
Poland: Warsaw	88	759	3.5	30.8	2.9	31.7	4.1	30.2
Denmark: Copenhagen	4	83	.7	15.4	1.1	14.5	.3	16.2
Norway:								
Bergen	1	38	.7	29.4	0	37.3	1.6	20.9
Oslo	12	230	2.3	45.3	2.7	49.3	2.1	42.2
Sweden:								
Goteborg	2	51	.6	16.4	1.4	11.7	0	20.5
Stockholm	1	21	.4	9.1	0	5.1	.7	7.0
Italy:								
Genoa	65	427	3.5	23.3	3.5	24.6	3.5	22.5
Naples	232	1,412	4.1	25.1	3.1	21.7	4.8	27.5
Palermo	327	648	14.3	28.3	12.2	31.5	15.7	26.2
Czechoslovakia: Prague	15	125	2.2	18.1	1.4	13.6	2.7	21.2
Austria: Vienna	6	58	1.6	15.6	2.5	16.3	.9	15.1
All European countries	851	6,278	3.2	23.6	2.8	23.5	3.5	23.7

TABLE 20.—*Number and percentage of quota and nonquota applicants examined who were notified for different classes of disabilities during the fiscal year 1932*

Country	Quota					Nonquota				
	Total number quota applicants examined	Number notified for—		Per cent of total examined who were notified for—		Total number nonquota applicants examined	Number notified for—		Per cent of total examined who were notified for—	
		Class A conditions	Class B conditions	Class A conditions	Class B conditions		Class A conditions	Class B conditions	Class A conditions	Class B conditions
WESTERN HEMISPHERE										
Cuba	462	25	66	5.4	14.3	695	44	45	6.3	6.5
Mexico	167	0	13	0	7.8	512	5	25	1.0	4.9
Canada	3,450	43	503	1.7	20.1	7,439	48	1,074	.5	14.4
All countries, Western Hemisphere	4,079	68	582	1.6	14.0	8,646	97	1,144	1.2	13.2
EUROPE										
Belgium	243	3	62	1.2	25.5	150	0	28	0	18.7
England	1,952	23	423	1.2	21.6	1,039	8	179	.7	17.2
Irish Free State	780	4	196	.5	25.1	246	2	72	.8	29.3
Northern Ireland	287	2	63	.7	21.9	88	2	18	2.3	20.4
Scotland	968	2	229	.2	23.6	468	0	63	0	13.5
Germany	3,496	26	682	.7	19.5	1,277	20	284	1.5	22.2
Holland	420	3	74	.7	17.6	109	2	26	1.8	23.8
Poland	1,458	58	532	3.9	36.5	1,000	30	227	3.0	22.7
Denmark	389	1	56	.2	14.4	150	3	27	2.0	18.0
Norway	418	7	175	1.6	41.8	218	6	93	2.7	42.6
Sweden	341	3	42	.8	12.3	200	0	30	0	15.0
Italy	3,117	156	1,528	5.0	49.0	6,624	468	959	7.1	14.5
Czechoslovakia	314	7	67	2.2	21.3	375	8	58	2.1	15.5
Austria	213	4	32	1.9	15.0	158	2	26	1.3	16.4
All European countries	14,396	299	4,161	2.1	28.9	12,102	551	2,090	4.5	17.3

TABLE 21.—*Percentage distribution of total quota and nonquota applicants of each sex examined who were notified for different classes of disabilities during the fiscal year 1932*

Country	Quota				Nonquota			
	Male		Female		Male		Female	
	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
WESTERN HEMISPHERE								
Cuba	4.2	14.1	9.2	11.1	5.0	7.2	7.5	5.8
Mexico	0	9.9	0	4.5	1.5	4.7	.4	5.0
Canada	1.4	15.7	1.6	13.2	.6	12.1	.6	11.0
All countries, Western Hemisphere	1.7	1.49	1.3	11.5	1.6	13.4	.8	15.0
EUROPE								
Belgium	2.1	23.0	0	28.8	0	16.9	0	20.2
England	1.3	20.8	1.0	22.2	1.2	19.6	.3	14.9
Irish Free State	.4	22.1	.5	26.5	1.0	20.8	.7	34.7
Northern Ireland	1.0	21.0	.5	22.4	0	14.3	3.7	24.5
Scotland	0	36.1	.3	15.6	0	13.6	0	13.3
Germany	.8	19.3	.7	19.7	1.3	22.6	1.8	21.9
Holland	.5	17.1	.9	18.0	0	22.9	3.2	24.6
Poland	3.2	35.7	4.7	37.3	2.3	23.7	3.4	22.0
Denmark	.5	14.3	0	14.5	2.8	15.3	1.3	20.5
Norway	1.9	40.9	1.4	42.8	2.5	61.2	2.8	31.8
Sweden	1.4	9.1	.5	14.6	0	12.0	0	18.0
Italy	5.2	44.8	4.8	52.5	5.4	13.1	8.0	15.3
Czechoslovakia	1.4	13.0	2.9	28.5	1.5	14.3	2.5	16.1
Austria	1.9	15.7	1.8	14.4	3.5	17.5	2.0	0
All European countries	2.2	28.6	1.9	29.1	3.5	16.9	5.3	17.5

TABLE 22.—*Number and percentage of applicants examined, total and by sex, who were refused visas on medical notification for different classes of disabilities during the fiscal year 1932*

Country and consular office	Number of visas refused—		Per cent of applicants examined who were refused visas for—		Percentage of males who were refused visas for—		Percentage of females who were refused visas for—	
	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
WESTERN HEMISPHERE								
Cuba: Habana	69	58	5.8	4.9	4.5	6.3	7.7	2.9
Mexico: Mexico City	5	14	.7	2.0	1.1	2.1	.3	2.0
Canada:								
Hamilton	6	76	.8	9.7	1.2	12.2	.3	6.6
Montreal	14	350	.1	8.2	.3	7.4	.3	9.2
Ottawa	5	44	1.0	9.6	1.3	9.3	.9	9.8
Quebec	2	5	.1	.2	.04	.1	.04	.1
Toronto	29	43	1.5	2.2	.9	1.4	.6	.8
Vancouver	3	35	.4	4.5	.6	.5	.3	.5
Windsor	17	191	.8	10.0	.9	11.6	.9	9.6
Winnipeg	6	7	.4	.5	.8	.7	0	.3
Yarmouth	1	22	.2	5.6	0	5.5	.4	5.7
All Canadian	83	773	.6	5.4	.6	4.7	.5	3.7
All countries, Western Hemisphere	157	845	1.0	5.2	.6	4.1	.7	3.6

TABLE 22.—*Number and percentage of applicants examined, total and by sex, who were refused visas on medical notification for different classes of disabilities during the fiscal year 1932*—Continued

Country and consular office	Number of visas refused—		Per cent of applicants examined who were refused visas for—		Percentage of males who were refused visas for—		Percentage of females who were refused visas for—	
	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
EUROPE								
Belgium: Antwerp	3	32	0.8	8.1	1.4	8.6	0	7.7
England:								
Liverpool	22	177	2.0	16.3	2.8	17.9	1.4	15.1
London	1	78	.1	5.0	.1	5.3	0	4.8
Southampton	9	25	2.5	7.0	2.3	10.0	2.6	4.2
Irish Free State:								
Cobh	3	64	.7	14.3	1.3	9.3	.3	15.4
Dublin	3	90	.5	15.2	0	16.9	.7	14.4
Northern Ireland: Belfast	4	61	1.0	16.0	.7	14.1	1.2	17.0
Scotland: Glasgow	2	216	.1	15.0	0	22.3	.2	9.8
Germany:								
Berlin	18	278	1.0	16.5	1.1	17.9	1.0	15.3
Bremen	5	18	1.0	3.6	1.4	5.1	.7	2.4
Cologne	11	60	1.1	6.4	.8	5.9	1.3	6.7
Hamburg	3	13	.5	2.3	.4	2.7	.6	1.9
Stuttgart	9	56	.8	5.2	.9	4.5	.8	5.5
Holland: Rotterdam	5	58	.9	10.4	.4	10.6	1.3	10.2
Poland: Warsaw	88	342	3.5	13.9	2.9	16.8	4.1	11.4
Denmark: Copenhagen	4	37	.7	6.8	1.1	8.9	.3	4.8
Norway:								
Bergen	1	10	.7	7.8	0	10.4	1.6	4.8
Oslo	12	148	2.3	29.2	2.7	35.8	2.1	23.9
Sweden:								
Goteburg	2	10	.6	3.2	1.4	6.9	0	5.4
Stockholm	1	12	.4	5.2	0	5.1	.7	5.3
Italy:								
Genoa	65	49	3.5	2.6	3.5	4.7	3.5	1.5
Naples	232	512	4.1	9.1	3.1	10.8	4.8	7.8
Palermo	327	199	14.3	8.7	12.2	13.3	15.7	5.6
Czechoslovakia: Prague	15	46	2.2	6.6	1.4	7.2	2.7	6.3
Austria: Vienna	6	12	1.6	3.2	2.5	6.9	.9	.5
All European countries	851	2,603	3.2	9.8	2.8	11.9	3.5	8.3

TABLE 23.—*Number and percentage of male and female applicants notified for class B disabilities who were refused visas on medical grounds during the fiscal year 1932*

Country and consular office	Number of applicants notified for class B conditions		Number applicants refused visas for class B conditions		Per cent of applicants notified who were refused visas for class B conditions	
	Male	Female	Male	Female	Male	Female
WESTERN HEMISPHERE						
Cuba: Habana	78	33	44	14	56.4	42.0
Mexico: Mexico City	23	15	8	6	35.0	40.0
Canada:						
Hamilton	70	47	53	23	75.7	48.9
Montreal	265	312	174	177	65.7	56.7
Ottawa	25	36	21	23	84.0	63.9
Quebec	52	69	2	3	3.8	.4
Toronto	60	89	27	16	18.1	10.7
Vancouver	45	32	19	16	44.0	50.0
Windsor	148	215	24	15	16.3	6.6
Winnipeg	42	45	5	2	11.9	4.4
Yarmouth	23	64	9	14	39.1	21.8
All Canadian	730	909	334	289	45.8	31.4
All countries, Western Hemisphere	831	957	386	309	46.5	31.9

TABLE 23.—*Number and percentage of male and female applicants notified for class B disabilities who were refused visas on medical grounds during the fiscal year 1932*—Continued

Country and consular office	Number of applicants notified for class B conditions		Number applicants refused visas for class B conditions		Per cent of applicants notified who were refused visas for class B conditions	
	Male	Female	Male	Female	Male	Female
EUROPE						
Belgium: Antwerp	44	46	18	14	40.9	30.4
England:						
Liverpool	127	174	82	95	64.5	54.6
London	107	128	37	41	34.6	32.0
Southampton	35	31	17	8	48.5	25.8
Irish Free State:						
Cobh	21	86	13	51	61.8	59.3
Dublin	55	114	32	58	58.2	50.9
Northern Ireland: Belfast	27	57	19	42	70.3	73.7
Scotland: Glasgow	168	127	134	82	79.7	64.5
Germany:						
Berlin	238	279	132	146	55.5	52.3
Bremen	25	58	11	7	44.0	12.1
Cologne	48	87	21	39	43.7	44.8
Hamburg	25	38	7	6	28.0	15.8
Stuttgart	48	127	14	42	29.2	33.1
Holland: Rotterdam	47	59	27	31	57.4	52.5
Poland: Warsaw	364	395	193	149	53.0	37.7
Denmark: Copenhagen	39	44	24	13	61.5	29.5
Norway:						
Bergen	25	13	7	3	28.0	23.1
Oslo	110	120	80	68	72.7	56.6
Sweden:						
Goteborg	17	34	5	5	29.4	14.7
Stockholm	8	13	5	7	62.5	53.8
Italy:						
Genoa	160	267	31	18	19.4	6.7
Naples	513	899	255	257	49.7	28.6
Palermo	291	357	123	76	42.2	21.3
Czechoslovakia: Prague	38	87	20	26	52.6	29.9
Austria: Vienna	26	32	11	1	42.3	3.1
All European countries	2,606	3,672	1,318	1,285	50.6	35.0

TABLE 24.—*Number and percentage of total quota and nonquota applicants examined who were refused visas on medical notification for different classes of disabilities during the fiscal year 1932*

Country	Quota					Nonquota				
	Total number of quota applicants examined	Number who were refused visas		Per cent of number examined who were refused visas		Total number of nonquota applicants examined	Number who were refused visas		Per cent of number examined who were refused visas	
		Class A	Class B	Class A	Class B		Class A	Class B	Class A	Class B
WESTERN HEMISPHERE										
Cuba	462	25	48	5.4	10.4	695	44	10	6.3	1.4
Mexico	167	0	4	0	2.4	512	5	10	1.0	2.0
Canada	3,450	43	234	1.2	6.6	7,439	46	380	.5	5.1
All countries, Western Hemisphere	4,079	68	286	1.6	6.9	8,646	95	400	.5	2.5
EUROPE										
Belgium	243	3	27	1.2	11.1	150	0	5	0	3.3
England	1,952	23	238	1.2	12.2	1,039	8	42	.7	4.0
Irish Free State	780	4	124	.5	16.4	246	2	25	.8	10.1
Northern Ireland	287	2	49	.7	17.1	88	2	11	2.3	12.5
Scotland	968	2	174	.2	17.9	468	0	40	0	8.5
Germany	3,496	26	349	.7	10.0	1,277	20	75	1.6	5.9
Holland	420	3	45	.7	10.7	109	2	11	1.8	10.1
Poland	1,458	58	254	3.9	17.4	1,000	30	88	3.0	8.8
Denmark	389	1	36	.2	9.3	150	3	1	2.0	.7
Norway	418	7	130	1.6	31.1	218	6	28	2.7	12.8
Sweden	341	3	14	.8	4.1	200	0	8	0	4.0
Italy	3,117	156	473	5.0	15.2	6,624	468	287	7.1	4.3
Czechoslovakia	314	7	26	2.2	8.3	375	8	20	2.1	5.3
Austria	213	4	7	1.9	3.3	158	2	5	1.3	3.2
All European countries	14,396	299	1,946	2.1	13.5	12,102	551	646	4.5	5.4

TABLE 25.—*Percentage distribution of the total quota and nonquota applicants notified for each class of disabilities who were refused visas on medical grounds during the fiscal year 1932*

Country	Quota						Nonquota					
	Number notified		Number refused visas		Per cent of notified cases refused visas		Number notified		Number refused visas		Per cent of notified cases refused visas	
	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
WESTERN HEMISPHERE												
Cuba	25	66	25	48	100	72.7	44	45	44	10	100.0	22.2
Mexico	0	13	0	4	0	30.8	5	25	5	10	100.0	40.0
Canada	43	503	41	234	95.4	46.5	39	1,074	37	38	95.1	35.4
All countries, Western Hemisphere	68	582	66	286	97.0	49.1	88	1,144	86	400	97.9	34.9
EUROPE												
Belgium	3	62	3	27	100.0	43.5	0	28	0	5	0	17.8
England	23	423	23	238	100.0	56.3	8	179	8	42	100.0	23.4
Irish Free State	4	196	4	124	100.0	63.2	2	72	2	25	100.0	34.7
Northern Ireland	2	63	2	49	100.0	77.7	2	18	2	11	100.0	61.1
Scotland	2	229	2	174	100.0	75.9	0	63	0	40	0	63.5
Germany	26	682	26	349	100.0	51.2	20	284	20	75	100.0	26.4
Holland	3	74	3	45	100.0	60.8	2	26	2	11	100.0	42.3
Poland	58	532	58	254	100.0	47.7	30	227	30	88	100.0	38.7
Denmark	1	56	1	36	100.0	64.3	3	27	3	1	100.0	3.7
Norway	7	175	7	130	100.0	74.3	6	93	6	28	100.0	30.1
Sweden	3	42	3	14	100.0	33.3	0	30	0	8	0	26.6
Italy	156	1,528	156	473	100.0	30.9	468	959	468	287	100.0	29.9
Czechoslovakia	7	67	7	26	100.0	38.8	8	58	8	20	100.0	34.5
Austria	4	32	4	7	100.0	21.9	2	26	2	5	100.0	19.2
All European countries	299	4,161	299	1,946	100.0	46.7	551	2,090	551	646	100.0	30.9

TABLE 26.—*Percentage distribution of total quota and nonquota applicants of each sex notified who were refused visas on medical grounds during the fiscal year, 1932*

Country	Quota				Nonquota			
	Male		Female		Male		Female	
	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
WESTERN HEMISPHERE								
Cuba	100.0	70.4	100.0	83.3	100.0	25.0	100.0	19.0
Mexico	0	40.0	0	0	100.0	30.8	100.0	50.0
Canada	100.0	51.2	100.0	40.0	100.0	43.9	91.0	29.8
All countries, Western Hemisphere	100.0	54.4	100.0	45.9	100.0	43.3	95.6	29.9
EUROPE								
Belgium	100.0	50.0	0	36.6	0	16.6	0	18.8
England	100.0	63.5	100.0	51.4	100.0	28.2	100.0	17.5
Irish Free State	100.0	62.3	100.0	63.6	100.0	50.0	100.0	28.8
Northern Ireland	100.0	75.0	100.0	79.0	100.0	80.0	100.0	53.8
Scotland	0	84.6	100.0	63.0	0	56.6	0	69.7
Germany	100.0	55.6	100.0	48.5	100.0	33.1	100.0	21.2
Holland	100.0	64.7	100.0	57.5	0	45.4	100.0	40.0
Poland	100.0	52.4	100.0	42.8	100.0	54.8	100.0	27.6
Denmark	100.0	82.1	0	46.4	100.0	9.0	100.0	0
Norway	100.0	79.1	100.0	69.6	100.0	38.8	100.0	20.4
Sweden	100.0	46.1	100.0	27.6	0	33.3	0	22.2
Italy	100.0	39.0	100.0	25.2	100.0	48.9	100.0	19.9
Czechoslovakia	100.0	52.6	100.0	33.3	100.0	52.6	100.0	25.6
Austria	100.0	37.5	100.0	6.2	100.0	50.0	0	0
All European countries	100.0	54.1	100.0	41.3	100.0	43.5	100.0	22.7

TABLE 27.—*Percentage distribution of total quota and nonquota applicants of each sex examined who were refused visas on medical notification, during the fiscal year, 1932*

Country	Quota				Nonquota			
	Male		Female		Male		Female	
	Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
WESTERN HEMISPHERE								
Cuba	4.2	10.7	9.3	9.3	5.1	1.8	7.5	1.1
Mexico	0	4.0	0	0	1.5	1.5	.4	2.5
Canada	1.2	8.1	1.3	5.3	.7	5.0	.4	4.9
All countries, Western Hemisphere	1.6	8.1	1.3	5.0	.9	5.0	.9	4.5
EUROPE								
Belgium	2.1	11.5	0	10.6	0	2.8	0	3.8
England	1.3	13.2	1.0	11.4	1.2	5.5	.3	2.6
Irish Free State	.4	13.7	.5	16.8	1.0	10.4	.7	10.0
Northern Ireland	1.0	15.8	.5	17.7	0	11.4	3.7	13.2
Scotland	0	30.6	.3	9.8	0	7.7	0	9.3
Germany	.8	10.7	.7	9.5	1.3	7.5	1.8	4.7
Holland	.5	11.1	.9	10.3	0	10.4	3.2	9.8
Poland	3.2	18.7	4.7	16.0	2.3	13.0	3.4	6.0
Denmark	.5	11.7	0	6.7	2.8	1.4	1.3	0
Norway	1.9	32.4	1.4	29.8	2.5	23.7	2.8	6.5
Sweden	1.4	4.2	.5	4.0	0	4.0	0	4.0
Italy	5.2	17.4	4.8	13.2	5.4	6.4	8.0	3.0
Czechoslovakia	1.4	7.0	2.9	9.5	1.5	7.5	2.5	4.1
Austria	1.9	5.9	1.8	.9	3.5	8.7	2.0	0
All European countries	2.2	15.5	1.9	12.0	3.5	7.4	5.3	3.9

TABLE 28.—*Number and percentage of quota and nonquota applicants of each sex who were refused visas for mental conditions during the fiscal year, 1932*

Country	Quota						Nonquota					
	Male			Female			Male			Female		
	Number examined	Number refused	Per cent refused	Number examined	Number refused	Per cent refused	Number examined	Number refused	Per cent refused	Number examined	Number refused	Per cent refused
WESTERN HEMISPHERE												
Cuba	354	2	0.6	108	1	0.9	335	0	0	360	4	1.1
Mexico	101	0	0	66	0	0	274	2	.7	238	1	.4
Canada	1,854	8	.4	1,596	12	.8	3,544	13	.4	3,895	11	.3
All countries, Western Hemisphere	2,309	10	.4	1,770	13	.8	4,153	15	.4	4,493	16	.3
EUROPE												
Belgium	139	3	2.15	104	0	0	71	0	0	79	0	0
England	815	8	.98	1,137	10	.88	503	4	.79	536	1	.18
Irish Free State	240	0	0	540	3	.55	96	0	0	150	1	.67
Northern Ireland	95	0	0	192	0	0	35	0	0	53	2	3.77
Scotland	379	0	0	589	2	.34	220	0	0	248	0	0
Germany	1,334	6	.45	2,162	10	.46	548	3	.55	729	10	1.37
Holland	198	1	.50	222	2	.90	48	0	0	61	2	3.27
Poland	758	7	.92	700	13	1.85	392	1	.25	608	13	2.14
Denmark	196	1	.50	193	0	0	72	1	1.39	78	1	1.28
Norway	210	1	.49	208	1	.48	80	0	0	138	2	1.45
Sweden	142	1	.70	199	0	0	100	0	0	100	0	0
Italy	1,413	3	.21	1,704	10	.58	2,523	27	1.07	4,101	94	2.29
Czechoslovakia	146	1	.68	168	1	.59	133	1	.75	242	4	1.65
Austria	102	0	0	111	2	1.80	57	0	0	101	0	0
All European countries	6,167	32	.52	8,229	54	.65	4,878	37	.76	7,224	130	1.79

TABLE 29.—*Number and character of the more serious mandatorily excludable conditions notified during the fiscal year, 1932*

WESTERN HEMISPHERE

Disease or defect	Cuba: Havana	Mexico: Mexico City	Canada										Total all stations
			Hamilton	Montreal	Ottawa	Quebec	Toronto	Vancouver	Windsor	Winnipeg	Yarmouth	Total	
Class A–I													
Insanity				1			5	1			1	8	8
Mental deficiency	3		2	6	1	5	7			2		23	26
Epilepsy							1		1			2	2
Feeble-minded	1	1	1				1		8			10	12
Constitutional psychopathic inferiority		1	2		1		4		1			8	9
Total class A–I	4	2	5	7	2	5	18	1	10	2	1	51	57
Class A–II													
Favus	24				1							1	25
Trachoma	32								3	1		4	36
Tuberculosis	3	1	1	3	2		7		1	4		18	22
Gonorrhea	2	1		4			3		2			9	12
Syphilis		1					1		1			2	3
Total class A–II	61	3	1	7	3	0	11	0	7	5	0	34	98
Total	65	5	6	14	5	5	29	1	17	7	1	85	155

EUROPE

Nature of defect	Belgium	England	Irish Free State	Northern Ireland	Scotland	Germany	Holland	Poland	Denmark	Norway	Sweden	Italy	Czechoslovakia	Austria	Total
Class A–I															
Dementia praecox											1				1
Epilepsy	1								1			2			4
Feeble-mindedness	1					2	1	11				31	3	1	50
Imbecility												1			1
Insanity		4				2		1	1	1		2			11
Idiocy												4			4
Mentally defective		12	3	1	2	19	1	22		2		84	3	1	150
Mentally retarded		1													1
Paresis									1						1
Psychopathic inferiority	1	5		1		5	3			1		7			23
Psychosis		1										1			2
Senile dementia		1	1			1						2	1		6
Total class A–I	3	24	4	2	2	29	5	34	3	4	1	134	7	2	254
Class A–II															
Amoebiasis										1					1
Loathsome contagious disease			1	1		1		19		3		58	1		84
Trachoma		1	1			4		26	1	1		390	4	3	430
Tuberculosis, pulmonary		6		1		7		8		5	1	25	3	1	57
Tuberculosis, other forms		1				3		1				9			14
Venereal diseases						2					1	8			11
Total class A–II	0	8	2	2	0	17	0	54	1	9	2	490	8	4	597
Grand total	3	32	6	4	2	46	5	88	4	13	3	624	15	6	851

144391—32——9

DIVISION OF SANITARY REPORTS AND STATISTICS

In charge of Asst. Surg. Gen. R. C. WILLIAMS

The Division of Sanitary Reports and Statistics is a clearing house for public health information. Reports of outbreaks of diseases dangerous to the public health and of the current prevalence of these diseases are received from all parts of the world, and the data are compiled, abstracted, tabulated, or otherwise made available and sent out to be used by health officers, sanitarians, and others who need the information in the work of protecting the public health. The division also compiles legislation and court decisions relating to public health, issues weekly the Public Health Reports, and distributes Public Health Service publications.

MORBIDITY AND MORTALITY REPORTS

Two States (Maine and Montana) were added to the number which met the requirements for admission to the proposed morbidity reporting area. Twenty-five States and the District of Columbia have qualified for admission to the area, nineteen States have not reached the required standards, and for four States the necessary data are not available.

Studies made during the year by State health departments have confirmed the results of previous studies by the Public Health Service and other agencies showing that reports of diseases dangerous to the public health are incomplete and in many respects inadequate to reveal conditions which must be known if the spread of these diseases is to be controlled.

It is expected that the morbidity reporting area, when established, will stimulate the reporting of communicable diseases and make the reports from States within the area fairly comparable with one another.

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. Throughout the year there was published for 4-week periods a summary of the current prevalence of the communicable diseases. These summaries pay especial attention to the current prevalence of the disease as compared to the same period of preceding years, with more extensive data on any disease that shows unusual prevalence in one or more sections of the country.

CURRENT STATE MORTALITY STATISTICS

The publication in the Public Health Reports of current mortality statistics from the States that could furnish the data to the Public Health Service was continued. Brief summaries of mortality were published for the first quarter and first half, and three-quarter period of the year, with a more detailed report on mortality throughout the calendar year 1931. These preliminary summaries make available rather detailed mortality data many months before final figures are available for the whole registration area. They are, therefore, very useful to health officers and other health workers.

In spite of the unfavorable economic conditions, the year 1931 was a period of low mortality. The death rate from all causes in a group of 18 States which were able to furnish the data early in 1932, having a population of more than 63,000,000, was 10.9 per 1,000, as compared to 11.3 in 1930 and 12.0 in 1929 in the same States. The death rates from typhoid fever, tuberculosis, and diarrhea and enteritis continued their steady decline. Even the degenerative diseases, such as nephritis, heart diseases, cerebral hemorrhage, and cancer, showed little or no increase over 1930; but it can not be assumed from this one favorable year that there is any change in the general upward trend in the death rates from these diseases. Diabetes was higher than for any preceding year.

COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS

The Public Health Service is obliged to depend largely upon the cooperation of State and local health officers for its reports of health conditions in the United States. To assist in securing reports of cases of communicable diseases, which are essential to the work of the Public Health Service, officers of State and local health departments are given appointments at the nominal salary of one dollar per annum as agents of the Public Health Service. Their duties are to collect and forward to the Public Health Service information of the prevalence and geographic distribution of diseases dangerous to the public health. This system of collecting morbidity reports was in use in 44 States during the fiscal year, with modifications to meet local conditions. In several of these States, however, the system is not in force in the entire State and in some it has a very limited use.

TELEGRAPHIC REPORTS

During the fiscal year, weekly telegraphic reports showing the reported prevalence of nine communicable diseases were received from all of the States except Nevada. The diseases included in these telegrams were diphtheria, influenza, measles, meningococcus meningitis, poliomyelitis, scarlet fever, smallpox, typhoid fever, and typhus fever.

The data are tabulated, mimeographed, and mailed to the State health officers promptly. The statistics are published in the weekly Public Health Reports with data showing the numbers of cases of these diseases reported for the corresponding week of the preceding year.

These telegraphic reports give a current index of the numbers of cases of the principal communicable diseases in the United States, which is utilized by State and local health officers as well as by the Public Health Service.

MONTHLY STATE REPORTS

Monthly reports were received during the year from all of the States except two. These reports show the number of cases of all diseases which are notifiable in each State. The reports show the geographical distribution of the cases within each State and give much useful information, but they are incomplete and in many respects the data from different States are not comparable.

ANNUAL STATE MORBIDITY REPORTS

The annual summary of cases of the principal communicable diseases for the year 1930 was prepared early in the fiscal year, but owing to the depleted state of the allotment for printing it was not possible to send the copy to the printer until after the close of the fiscal year. The 1931 volume was nearly ready for the printer on June 30, 1932.

WEEKLY AND ANNUAL CITY REPORTS

Reports from cities are received weekly and annually. The current reports from cities are of especial value, because they give the earliest information of the numbers of deaths from the principal communicable diseases. For influenza, pneumonia, and some other diseases, the reports of cases are so incomplete that the reports of deaths must be relied on for an index of prevalence.

Weekly reports are received by mail from about 700 cities of over 10,000 population. Annual reports are requested from all cities in the United States in this population class. The volume giving statistics for 1930 for cities of over 100,000 population was issued during the fiscal year, but the volume containing information for cities of between 10,000 and 100,000 population has not been printed because of lack of funds.

FOREIGN REPORTS

The basis of the morbidity reports received by the Division of Sanitary Reports and Statistics from foreign countries is the information obtained from Public Health Service officers stationed abroad and from American consular officers. The consular officers have been collecting, for the Public Health Service, data concerning the prevalence of diseases dangerous to the public health since the enactment of the act of April 29, 1878. These reports are supplemented by current reports from the Pan American Sanitary Bureau, the International Office of Public Hygiene at Paris, the health section of the League of Nations, communications and publications from foreign governments, and other sources. During the fiscal year these reports were compiled, tabulated, or abstracted, and the data were published for the information of health officers and others who were interested.

International Exchange of Sanitary Information

During the fiscal year the provisions of the International Sanitary Conventions of June 21, 1926, and November 24, 1924, were complied with by prompt notification to foreign governments, through the proper agencies, of cases of quarantinable diseases and the progress

of epidemics or outbreaks occurring in the United States and its possessions. In return, information was received from foreign governments, either directly or through international agencies, of similar occurrences in their territory. There was a regular weekly interchange of sanitary information with the Department of Pensions and National Health of Canada.

Prevalence of Communicable Diseases During Calendar Year 1931

Reports to the Public Health Service indicated generally good health conditions in the United States during the calendar year 1931. Preliminary reports indicate that the death rate for the year was low, the tuberculosis death rate reached a new low record, the number of deaths from pellagra decreased, and the morbidity reports for most of the principal communicable diseases were favorable as compared with preceding years.

The accompanying table gives a comparison of the numbers of cases of the principal communicable diseases and deaths from these diseases in the United States for the calendar years 1929, 1930, and 1931:

CASES

Disease	Number of States[1]	Aggregate population (in thousands)			Cases			Cases per 100,000 population		
		1929	1930	1931	1929	1930	1931	1929	1930	1931
Chicken pox	44	114,386	115,994	116,843	199,528	212,655	219,985	174.4	183.3	188.3
Diphtheria	46	119,993	121,644	122,515	84,755	65,924	70,327	70.6	54.2	57.4
Influenza	46	119,993	121,644	122,515						
Malaria	46	119,993	121,644	122,515						
Measles	46	119,993	121,644	122,515	364,379	398,021	469,714	303.7	327.2	383.4
Meningococcus meningitis	38	110,493	112,059	112,884	9,501	7,794	5,261	8.6	7.0	4.7
Mumps	39	100,125	101,529	102,270	95,367	112,930	121,557	95.2	111.2	118.9
Pellagra	46	119,993	121,644	122,515						
Pneumonia (all forms)	45	115,772	117,385	118,235						
Poliomyelitis	37	99,910	101,293	102,021	2,759	8,240	15,672	2.8	8.1	15.4
Scarlet fever	46	119,993	121,644	122,515	180,178	171,822	199,179	150.2	141.2	162.6
Smallpox	46	119,993	121,644	122,515	40,810	48,204	29,924	34.0	39.6	24.4
Tuberculosis (all forms)	45	119,565	121,206	122,072						
Tuberculosis (respiratory system)	40	109,483	111,043	111,866						
Typhoid fever	46	119,993	121,644	122,515	22,941	26,871	26,250	19.1	22.1	21.4
Whooping cough	46	119,993	121,644	122,515	194,478	158,010	167,350	162.1	129.9	136.6

DEATHS

Disease	Deaths			Deaths per 100,000 population			Cases reported for each death registered		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Chicken pox	141	114	140	0.1	0.1	0.1	1,415	1,865	1,571
Diphtheria	7,889	5,962	6,099	6.6	4.9	5.0	11	11	12
Influenza	65,534	22,791	31,974	54.6	18.7	26.1			
Malaria	4,144	3,426	2,649	3.5	2.8	2.2			
Measles	2,909	3,413	3,312	2.4	2.8	2.7	125	117	142
Meningococcus meningitis	4,260	3,470	2,467	3.9	3.1	2.2	2	2	2
Mumps	93	71	80	.1	.1	.1	1,025	1,591	1,519
Pellagra	7,401	7,137	5,853	6.2	5.9	4.8			
Pneumonia (all forms)	109,354	97,526	98,945	94.5	83.1	83.7			
Poliomyelitis	686	1,121	1,884	.7	1.1	1.8	4	7	8
Scarlet fever	2,471	2,201	2,588	2.1	1.8	2.1	73	78	77
Smallpox	139	170	102	.1	.1	.1	294	284	293
Tuberculosis (all forms)	87,636	83,376	80,890	73.3	68.8	66.3			
Tuberculosis (respiratory system)	74,117	70,082	68,120	67.7	63.1	60.9			
Typhoid fever	5,152	6,061	5,654	4.3	5.0	4.6	4	4	5
Whooping cough	6,890	5,388	4,423	5.7	4.4	3.6	28	29	38

[1] In addition to the number of States given, the District of Columbia is included in all diseases except mumps.

Cholera.—Asiatic cholera did not appear in the United States during 1931. In the Philippine Islands 936 cases of cholera were reported, as compared with 4,600 cases during the calendar year 1930.

Diphtheria.—In 1931, 46 States reported 70,327 cases of diphtheria, as compared with 65,924 cases for 1930. The 1930 case and death rates for diphtheria were the lowest ever recorded by the Public Health Service and the reaction in 1931 was very slight.

Influenza and pneumonia.—Comparatively low death rates for influenza and pneumonia contributed to make the relatively low general death rates for the years 1930 and 1931. In the winter of 1931 there was a decided increase in the incidence of influenza, the outbreak reaching its peak about the first of February. The disease was mild and comparatively few of the cases developed pneumonia. The death rates for influenza and pneumonia combined for the last three years are as follows: 1929, 149.1 per 100,000 population; 1930, 101.8; and 1931, 109.8.

Malaria.—Reports from 46 States gave death rates from malaria as follows: 1929, 3.5 per 100,000 population; 1930, 2.8; 1931, 2.2 per 100,000.

Measles.—Nearly half a million cases of measles were reported by 46 States in 1931. The actual number of cases was greater than this figure, as many cases of measles are not reported. The measles case rate increased from 327.2 cases per 100,000 population in 1930 to 383.4 per 100,000 in 1931.

Meningococcus meningitis.—The incidence of meningococcus meningitis (epidemic cerebrospinal meningitis) in the United States increased each year from 1925 to 1929. In the latter year 8.6 cases per 100,000 population were reported. In 1930 the rate dropped to 7.0 per 100,000, and in 1931 it was 4.7 per 100,000.

Pellagra.—The death rate from pellagra in 46 States in 1929 was 6.2 per 100,000 population. In 1930 it was 5.9, and in 1931, 4.8 per 100,000. Many health workers feared that unfavorable economic conditions might result in an increase in the incidence of pellagra. In many communities where the need seemed greatest measures were taken to make pellagra-preventing foods available to the people, and it is probable that these measures are responsible, in part at least, for the comparatively favorable reports for 1930 and 1931. Incomplete reports for the first six months of the year 1932 indicate that there was a decrease in the prevalence of pellagra during that period as compared with the corresponding period of 1931.

Plague.—No case of plague was reported in continental United States during the year 1931, but six plague-infected ground squirrels were found in Monterey County, Calif., in May and June, 1931, and eight plague-infected ground squirrels were found in July and August, 1931, in San Benito County, Calif. A fatal case of plague was reported in August, 1931, on Maui Island, Territory of Hawaii, and during the year six plague-infected rats were found in the Hawaiian Islands.

During the first six months of 1932, seven plague-infected rats were found in the Hawaiian Islands, and four in Los Angeles, Calif.

Poliomyelitis.—During the summer and early fall of 1931 a serious epidemic of poliomyelitis (infantile paralysis) occurred, affecting principally States in the northeastern part of the country, including

all of New England, New York, New Jersey, Minnesota, Wisconsin, and Michigan. Fifteen thousand seven hundred cases were reported by 37 States. The outbreak was the most severe since 1916, when 27,500 cases were reported by 30 States. Some States reported more cases of poliomyelitis in 1930 than they did in 1931. Among these States were California, Colorado, Kansas, Louisiana, Maine, Nebraska Ohio, South Dakota, and Wyoming.

Scarlet fever.—Nearly 200,000 cases of scarlet fever were reported during 1931. The case rate (162.6 per 100,000 population) was the highest since 1927, but the death rate was the same as that for the year 1929 (2.1 per 100,000). This disease is considered important by public health workers because of the possible after effects.

Smallpox.—Less than 30,000 cases of smallpox were reported to the Public Health Service in 1931 by 46 States, as compared with 48,000 cases in 1930. The disease was of the mild form, and only 102 deaths from smallpox were reported in 1931, giving a fatality ratio of 293 cases for each death. Delaware, the District of Columbia, Maryland, and Rhode Island did not report any case of smallpox, while more than half of the total was reported by seven States. Opposition to vaccination has been manifested in some of the States which reported considerable numbers of cases of smallpox.

Tuberculosis.—Again a record low death rate has been registered for tuberculosis. The death rate for 1931 was 66.3 deaths per 100,000 population. Reports were received for 45 States. Since 1918 each year has shown improvement over the preceding year in the tuberculosis death rate. In 1918 the rate was 125.6 tuberculosis deaths per 100,000 population.

Typhoid fever.—During 1931, 26,250 cases of typhoid fever were reported by 46 States, as compared with 26,871 cases in 1930 and 22,941 cases in 1929. There was a further increase in the incidence of typhoid fever during the first six months of 1932, 5,900 cases being reported, as compared with 4,500 cases during the corresponding period of 1931.

Yellow fever.—Yellow fever has not appeared in epidemic form in the United States since 1905. The disease is endemic, however, in parts of South America and Africa. Although the manner of spread of yellow fever and the means of its control are known, its appearance in a nonimmune population might be disastrous.

Inquiries as to Health Conditions

Many inquiries were received by the Division of Sanitary Reports and Statistics for information as to the prevalence of certain diseases in parts of the United States or in foreign countries. The information was given whenever it was possible to do so.

Directories of Health Officers

Data for the annual directories of State, city, and wholetime county health officers in the United States for the year 1930 were collected during the fiscal year and the directories were published in the Public Health Reports, but owing to lack of funds the reprints were not issued until after the close of the fiscal year.

Sanitary Legislation and Court Decisions

Laws, ordinances, and regulations.—During the fiscal year the compilation of the State and Federal health laws and regulations for the years 1929 and 1930 was completed. The text of these laws and regulations, however, will not be published as has heretofore been the practice since 1911, but the material is to be made available through a list of citations to the various laws and regulations arranged according to subject matter. Beginning with the year 1931 it is intended to present the State and Federal health laws and regulations in the form of a review, and to this end the material for 1931 was collected during the fiscal year.

There was also completed for publication a review of the more important provisions of the existing laws and regulations of the various States pertaining to morbidity reporting.

Since 1910 the Public Health Service has published periodically compilations of municipal health ordinances and regulations. In connection with this work there were collected during the year those ordinances and regulations relative to public health which were adopted during 1931 by cities in the United States having a population of over 10,000.

Decisions.—As has been done for many years, abstracts were prepared of current decisions on public health matters rendered by State and Federal courts of last resort, and such abstracts were published in the Public Health Reports.

Inquiries.—Numerous requests for data and information concerning legislation and court decisions on health matters were received during the year and were complied with as fully as possible.

Publications Issued by the Division

The Public Health Reports was issued by the division each week during the year. The 52 issues (vol. 46, pt. 2, and vol. 47, pt. 1) contained 3,008 pages exclusive of title pages and pages of contents, as compared with 3,285 pages in 1931, 3,143 in 1930, and 3,362 in 1929.

This weekly periodical, established in 1878, contains summaries of morbidity reports received by telegraph and mail from State and city health authorities, giving a current index to health conditions throughout the country with reference to the most important communicable diseases, and it is the official medium of the Public Health Service for the publication of reports on current research work being undertaken by Public Health Service research workers and of other public health information. In addition, the Public Health Reports contained the reports from various official sources of quarantinable diseases throughout the world, articles relating to public health administration, and abstracts of current court decisions having a bearing on public health. The average number of copies printed of each issue was about 9,500, approximately the same as that for the preceding fiscal year. Thirty-five of the most important articles appearing in the Public Health Reports during the year were issued in separate form as reprints, providing for a more economical distribution to persons interested in the various subjects. Ninety-seven such reprints were issued in 1931 and 94 in 1930. It was found impossible to issue more of these

articles in separate form because of lack of printing funds, resulting from increased needs for printing consequent upon greatly increased duties imposed upon the Public Health Service by law, together with a decreased printing allotment. From the same necessity, supplements to the Public Health Reports, including the latest State laws and regulations relating to public health and compilations of the notifiable diseases in States and cities during 1930, were held in abeyance. This material was assembled and prepared for the printer, but it was found impossible to conserve the printing fund sufficiently to provide for them.

In cooperation with various negro health organizations, the United States Public Health Service, through this division, issued the National Negro Health Week Bulletin and Poster for 1932. The bulletin contained the outline of a program designed to aid in community effort directed to the solution of important health problems, while the poster was a pictorial notice calling attention to the date of the observance of National Negro Health Week and stating the objectives for 1932. The bulletin was effectively illustrated, with the text reduced to a minimum. The chief of the division was the representative of the United States Public Health Service on the executive committee of the national negro health movement. The bulletin and poster have been issued by this division since 1924.

A technical publication on the Chemistry of the Opium Alkaloids was edited and prepared for the printer in the division during the year, and new editions of several previously printed publications were issued.

PUBLIC HEALTH EDUCATION

During the fiscal year, 68 new service publications were distributed by the division, as compared with 116 during the preceding year. The smaller number of new publications distributed was due to the lack of funds for printing. The total distribution of copies of new publications and of editions of previously published documents aggregated 350,391, as compared with 528,257 for the fiscal year 1931. Out of the 350,391 copies of publications distributed, 189,228 were sent in response to individual requests for information. The remaining 161,163 copies were distributed to the various mailing lists maintained by the bureau. This distribution includes all publications printed and distributed by the bureau, except certain publications of the Division of Venereal Diseases, the Public Health Service regulations, and the official service roster, distributed by the office of the chief clerk and administrative officer.

There were 32 requests for the loan of stereopticon lantern slides during the year. In response to these requests, 1,265 slides were loaned to universities, health officers, public health lecturers, officials of the Public Health Service, and others for use in 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 handicapped for some time by the shortage of slides, and the lack of funds for making new slides and replacing those broken or lost in shipment. Several new sets of slides were added during the year, through the use of funds provided for this purpose.

Each year many 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 the promotion of the public health through the display of exhibits on public health subjects. For a number of years compliance with such requests was not possible, due to the lack of funds for the preparation of suitable exhibit material. A small 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 was available for use during this fiscal year. Several creditable exhibits were prepared. Among the subjects covered were pellagra, tularaemia, and milk sanitation. Exhibits on smallpox and vaccination, leprosy, trachoma, the proper illumination of rooms, and on ships' medicine chests were presented at the meeting of the Inter-State Postgraduate Medical Association in Milwaukee, Wis., October 19 to 23, 1931. Exhibits on smallpox and vaccination, leprosy, and trachoma were presented at the annual meeting of the Southern Medical Association in New Orleans, La., November 18 to 20, 1931. These exhibits were also displayed at the meeting of the American Association for the Advancement of Science in New Orleans during December, 1931, and January, 1932. An extensive exhibit on the subject of poliomyelitis was prepared by the service in cooperation with the committee on scientific exhibits of the American Medical Association for display at the annual meeting of the American Medical Association, which was held at New Orleans, La., May 9 to 13, 1932. Exhibits relating to the scientific investigations of the service with regard to the treatment of leprosy and pellagra were also displayed at this meeting.

Equipment for the preparation of motion-picture films on health subjects and the proper display of films, stereopticon slides, and other exhibit material of the Public Health Service at public health meetings was obtained during the year. This material will be of considerable value to the Public Health Service in connection with efforts now being made to aid in the control of the diseases of man by the dissemination of public health information.

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

1456. The Action of Sulphydryl, Iron, and Cyanide Compounds on the Oxygen Consumption of Living Cells. By Sanford M. Rosenthal and Carl Voegtlin. March 6, 1931. 19 pages.

1461. Phosphorus, Total Calcium, and Diffusible Calcium Content of the Blood Sera of Lepers and Their Relation to Bone Changes. By Jerald G. Wooley, with the technical assistance of Hilary Ross. March 20, 1931. 18 pages.

1463. Experimental Addiction of Animals to Opiates. By Lawrence Kolb and A. G. Du Mez. March 27, 1931. 28 pages.

1465. Sickness Among Industrial Employees in the Second Half of 1930. April 3, 1931. 3 pages.

1466. Preliminary Report of Committee on Milk Production and Control. White House Conference on Child Health and Protection. April 3, 1931. 42 pages.

1467. The Psittacosis Outbreak in Maryland, December, 1929, and January, 1930. By V. L. Ellicott and Charles H. Halliday. April 10, 1931. 8 pages.

1468. Influence on Epilepsy of a Diet Low in the Pellagra-Preventive Factor. By N. P. Walker and G. A. Wheeler, April 10, 1931. 10 pages.
1469. Studies on Meningococci Isolated in the United States, 1928–1930. Serological Classification and Geographic Distribution. By Sara E. Branham, Clara E. Taft, and Sadie A. Carlin. April 17, 1931. 20 pages.
1470. Observations on the Assay of the Antineuritic Vitamin. Some of the Factors Involved in the Use of the Rat Method. By W. H. Sebrell and E. Elvove. April 17, 1931. 9 pages.
1471. Significance of Positive Wassermann and Kahn Reactions in Leprosy. By L. F. Badger. Arpil 24, 1931. 14 pages.
1472. The County Health Unit of Yesterday and To-day. By Fred T. Foard. April 24, 1931. 7 pages.
1473. Fumigants. By C. L. Williams. May 1, 1931. 19 pages.
1474. Criteria for Maintaining Balance of Program in County Health Departments. By F. L. Roberts. May 8, 1931. 6 pages.
1475. Experimental Studies of Natural Purification in Polluted Waters. V. The Selection of Dilution Waters for Use in Oxygen Demand Tests. By Emery J. Theriault, Paul D. McNamee, and Chester T. Butterfield. May 8, 1931. 32 pages.
1476. Public Health Progress in Knoxville, Tenn. By Joseph W. Mountin. May 15 and 22, 1931. 61 pages.
1477. The Epidemic of So-called Ginger Paralysis in Southern California in 1930–31. By Maurice I. Smith and E. Elvove. May 22, 1931. 9 pages.
1478. Development of the Proposed Morbidity Reporting Area. By R. C. Williams. May 29, 1931. 6 pages.
1479. Studies on the Biochemistry of Sulphur. XI. The Substitution of Dithioethylamine (Cystine Amine) for Cystine in the Diet of the White Rat. By M. X. Sullivan, W. C. Hess, and W. H. Sebrell. May 29, 1931. 7 pages.
1480. Experimental Studies of Natural Purification in Polluted Waters. VI. Rate of Disappearance of Oxygen in Sludge. By Emery J. Theriault and Paul D. McNamee. May 29, 1931. 18 pages.
1481. Résumé of Report on Sanitation and Yellow Fever Control in Liberia. By H. F. Smith. June 5, 1931. 7 pages.
1482. Venereal Disease Among Coast Guard Enlisted Personnel During the Fiscal Year 1930. By W. W. King. June 5, 1931. 6 pages.
1483. Rocky Mountain Spotted Fever (Eastern type). Transmission by the American Dog Tick (Dermacentor variabilis). By R. E. Dyer, L. F. Badger, and A. Rumreich. June 12, 1931. 11 pages.
1484. Results of the Operation of the Standard Milk Ordinance in Missouri. By Franklin A Clark and W. Scott Johnson. June 12, 1931. 12 pages.
1485. Report of Committee on Milk. Conference of State and Provincial Health Authorities of North America. By Earle G. Brown. June 19, 1931. 5 pages.
1486. An Epidemiological Study of Typhoid Fever in Six Ohio River Cities. By M. V. Veldee. June 19, 1931. 27 pages.
1487. Prevalence of Undulant Fever in the United States. By H. E. Hasseltine. June 26, 1931. 5 pages.
1488. Studies in Asphyxia. I. Neuropathology Resulting from Comparatively Rapid Carbon-Monoxide Asphyxia. By John Chornyak and R. R. Sayers. June 26, 1931. 8 pages.
1489. Three Outbreaks of Food Poisoning Apparently Due to B. Enteritidis, B. Paratyphosus B (aertrycke type), and B. Paratyphosus A, Respectively. By J. C. Geiger, Margaret Nelson, J. P. Gray, F. Firestone, and H. L. Wynns. July 3, 1931. 8 pages.
1490. Some Essential Considerations in Connection with the Rural Health Program. By W. F. Draper. July 10, 1931. 6 pages.
1491. Public Health Service Publications. A List of Publications Issued During the Period January-June, 1931. July 10, 1931. 4 pages.
1492. The Physical Examination as an Instrument of Research. By Rollo H. Britten. July 17, 1931. 6 pages.
1493. A new Subspecies, Radicans, of Alcaligenes Faecalis. By Alice C. Evans July 17, 1931. 4 pages.
1494. The Need for Continued Study in Public Health Work. By W. S. Leathers. July 24, 1931. 11 pages.
1495. The Chemistry of Cell Division. II. The Relation Between Cell Growth and Division in Amoeba Proteus. By H. W. Chalkley. July 24, 1931. 19 pages.

1496. Sickness Among Male Industrial Employees in the First Quarter of 1931. By Dean K. Brundage. July 31, 1931. 2 pages.
1497. A Study of Illness Among Grade School Children. By Charles C. Wilson, Ira V. Hiscock, J. H. Watkins, and Jarvis D. Case, with the cooperation of John L. Rice. July 31, 1931. 23 pages.
1498. Typhus Fever. The Rat Flea, Xenopsylla Cheopis, in Experimental Transmission. By R. E. Dyer, E. T. Ceder, A Rumreich, and L. F. Badger, August 7, 1931. 2 pages.
1499. Coordination in the Sanitary Control of Bottled Mineral Waters. By W. S. Frisbie. August 7, 1931. 3 pages.
1500. Age and Sex Incidence of Influenza and Pneumonia Morbidity and Mortality in the Epidemic of 1928–29 with Comparative Data for the Epidemic of 1918–19. (Based on Surveys of Families in Certain Localities in the United States Following the Epidemics.) By Selwyn D. Collins. August 14, 1931. 29 pages.
1501. Dermatitis Venenata Due to Contact with Brazilian Walnut Wood. By Louis Schwartz. August 14, 1931. 5 pages.
1502. Public Health Service in Knox County, Tenn. Fiscal Year July 1, 1929–June 30, 1930. By Joseph W. Mountin. August 21, 1931. 18 pages.
1503. A Technique for Adjustment of pH of Hanging Drop Tissue Cultures. By W. R. Earle. August 21, 1931. 11 pages.
1504. The Medical Profession and the Health Department. By A. J. McLaughlin. August 28, 1931. 7 pages.
1505. Expansion of Investigations on Tick-Borne Diseases by the United States Public Health Service. By R. R. Spencer. September 4, 1931. 5 pages.
1506. A Survey of the Work of Employees' Mutual Benefit Associations. By Dean K. Brundage. September 4, 1931. 18 pages.
1507. Cooperative Campaign for the Eradication of Plague in Peru. Final Report. By John D. Long. September 11, 1931. 8 pages.
1508. Occurrence of a Colony of the Tick Parasite Hunterellus Hookeri Howard in West Africa. By Cornelius B. Philip. September 11, 1931. 5 pages.
1509. Extent of Rural Health Service in the United States 1927–1931. September 11, 1931. 14 pages.
1510. A Note on the History of Pellagra in the United States. By G. A. Wheeler. September 18, 1931. 7 pages.
1511. Sleeping Car Parking and Sanitation at a Large Convention. By G. H. Ferguson. September 18, 1931. 5 pages.
1512. The Catalytic Action of Copper in the Oxidation of Crystalline Glutathione. By Carl Voegtlin, J. M. Johnson, and Sanford M. Rosenthal. September 18, 1931. 20 pages.
1517. Experimental Transmission of Endemic Typhus Fever of the United States by the Rat Flea (Xenopsylla cheopis). By R. E. Dyer, E. T. Ceder, A Rumreich, and L. F. Badger. October 9, 1931. 2 pages.
1520. Typhus Fever. The Experimental Transmission of Endemic Typhus Fever of the United States by the Rat Flea Xenopsylla cheopis. By R. E. Dyer, E. T. Ceder, R. D. Lillie, A. Rumreich, and L. F. Badger. October 16, 1931. 19 pages.

SUPPLEMENTS TO THE PUBLIC HEALTH REPORTS

93. The Rat Proofing of Vessels. With Drawings Illustrating the General Instructions for Rat Proofing of Ships Compiled and Promulgated by the American Marine Standards Committee (H No. 41, Approved February 8, 1929). By S. B. Grubbs and B. E. Holsendorf. 1931. 84 pages.
96. Proceedings of the Conference of Representatives of Medical, Dental, Pharmaceutical, and Veterinary Associations, and Other Scientific Associations and Agencies with the Surgeon General of the United States Public Health Service. Held at Washington, D. C., August 12, 1930. 1931. 77 pages.
97. Division of Mental Hygiene, United States Public Health Service. Laws Establishing the Division and Authorizing Its Functions. 1931. 13 pages.
98. The Notifiable Diseases. Prevalence During 1930 in Cities of Over 100,000. 1931. 37 pages.
101. Public Health Administration in Colorado. By C. E. Waller. 1931. 79 pages.
102. Some Public Health Service Publications Suitable for General Distribution. 1931. 19 pages.

PUBLIC HEALTH BULLETINS

200. The Health of the School Child. A Study of Sickness, Physical Defects, and Mortality. By Selwyn D. Collins, with an Introduction by Taliaferro Clark. August, 1931. 159 pages.
201. Transactions of the Twenty-Eighth Annual Conference of State and Territorial Health Officers with the United States Public Health Service, Held at Washington, D. C., June 18, 19, and 20, 1930. April, 1932. 113 pages.

NATIONAL INSTITUTE OF HEALTH BULLETINS [1]

159. Key-Catalogue of Parasites Reported for Insectivora (Moles, Shrews, etc.) with Their Possible Public Health Importance. By C. W. Stiles and Samuel F. Stanley. June, 1931. 121 pages.

ANNUAL REPORT

Annual Report of the Surgeon General of the United States Public Health Service for the Fiscal Year 1931. 354 pages.

MISCELLANEOUS PUBLICATION

11. Official List of Commissioned and Other Officers of the United States Public Health Service; Also a List of All Stations of the Service. January 1, 1932. 64 pages.

UNNUMBERED PUBLICATIONS

To a Patient En Route to the Marine Hospital, Fort Stanton, N. Mex. 3 pages.
Index to Public Health Reports, Volume 46, Part 1, January–June, 1931. 30 pages. (Out of print.)
Index to Public Health Reports, Volume 46, Part 2, July-December, 1931. 27 pages.
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. Eighteenth Annual Observance. 1932. 16 pages. (Out of print.)
National Negro Health Week Poster. Eighteenth Annual Observance. 1932. (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

During industrial depression, even with a decline in shipping activities, certain classes of beneficiaries apply for treatment, especially operations of election, for which in more prosperous seasons they are unwilling to spare the time. The demands upon the marine hospitals and other relief stations did not materially change during the past fiscal year. The actual number of seamen beneficiaries has probably not diminished even though sailings have been interrupted and vessels laid up for periods. Moreover, unemployment among seamen tends to retard discharges from hospital of indigent convalescents, who are fearful of becoming public charges.

Economy in administration made it possible to return $293,793 to the general treasury fund out of the annual appropriations. This was largely due to lowered prices of commodities and the elimination of waste. The average per diem cost in the 23 general hospitals was $3.81, and for all the marine hospitals was $3.77. Hospital standards have been fairly well maintained, although the ratio of medical officers, nurses, and other hospital personnel to the number of patients is lower than in most other government hospitals. An aggregate of 137,672 X-ray examinations were made and 371,777 clinical laboratory examinations performed, including 74,868 examinations of blood for syphilis, 115,456 urinalyses, 28,949 sputum examinations, 2,157 dark field examinations for the early diagnosis of syphilis, 4,077 blood coagulation timings preparatory to surgical operations, and 63,357 other examinations of blood. There were 540 autopsies performed in the marine hospitals, representing 49 per cent of deaths occurring in these institutions. There was a total of 88,833 surgical operations, major and minor, which does not include 45,916 intravenous injections of salvarsan, arsphenamine, and kindred preparations.

There were 1,211 deaths in the marine hospitals and contract institutions, including 247 from tuberculosis (all kinds), 245 from diseases of the circulatory system, 91 from pneumonia and bronchopneumonia, 142 from cancer and other malignant tumors, and 62 from nephritis (acute and chronic). Alcoholism, acute and chronic, caused 3 deaths, and cirrhosis of the liver 13; there were 45 deaths from apoplexy; 41 from syphilis; and 58 from external causes of which the most frequent was fracture. There were 9 deaths from typhoid and paratyphoid fever.

The customary collateral functions carried out in addition to the routine care of the sick included 76,179 physical examinations for the Civil Service Commission, Steamboat Inspection Service, and other Government agencies, the issuance of 5,826 certificates of medicinal need of liquors aboard vessels, the instruction and examination in the

principles of first aid required by the Steamboat Inspection Service at 46 designated stations for ship's officers and candidates for licenses, consuming a total of 2,579 hours by the medical officers engaged.

While there was a time when the majority of merchant seamen who manned American vessels were foreign born, there is evidence that Americans are returning to the sea. In the nativity of the 38,176 American seamen discharged from hospital, 35 countries were represented, 28,052 seamen were born in the United States, 1,177 in Norway, 951 in the insular possessions of the United States, 740 in Canada, 715 in Germany, 706 in Sweden, and 492 in England.

The marine hospitals cooperated with the Division of Scientific Research and with the Division of Venereal Diseases in investigative and preventive measures in various ports.

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	994,998	57.37	491,289	50.55	9,937	13.05	Communicable diseases are reported to local health officers.
Veterans	348,531	20.09	5,752	.57	1,092	1.43	Patients of the Veterans' Administration.
Lepers	130,387	7.52	3	------	------	------	National Leper Home, Carville, La.
Coast Guard personnel	91,655	5.28	198,800	20.45	11,481	15.07	All medical services and supplies, ashore and afloat.
Injured Federal employees	63,623	3.67	171,172	17.61	20,002	26.26	Patients of the Employees' Compensation Commission.
Immigrants	38,143	2.20	19,094	1.97	475	.62	Patients of the Bureau of Immigration.
Seamen, Engineer Corps, and Army Transport Service.	35,797	2.06	11,318	1.17	77	.10	Civilian employees on Army vessels.
Seamen from foreign vessels	6,944	.40	1,123	.12	8	------	Pay patients.
Seamen and keepers, Lighthouse Service.	9,077	.52	6,231	.64	200	.26	Medical supplies also furnished to lighthouse vessels.
Alaska cannery workers leaving United States.	------	------	408	.04	4,869	6.39	Vaccinations and other preventive measures.
Pilots and other licensees	------	------	------	------	*6,935	9.11	For the Steamboat Inspection Service.
Civil service applicants and employees.	------	------	------	------	13,299	17.46	For the Civil Service Commission.
Shipping Board	------	------	------	------	1,910	2.51	To determine fitness for sea duty.
All others entitled to treatment.	15,353	.89	66,920	6.88	5,894	7.74	From Bureau of Fisheries, Army, Navy, Mississippi River Commission, Coast and Geodetic Survey, etc.
Total	1,734,508	100.00	972,110	100.00	76,179	100.00	

DENTAL TREATMENT

The total cost of all dental treatment at marine hospitals and relief stations, including salaries of dental officers, dental internes, hygienists, nurses, assistants, technicians, supplies, repairs to equip-

ment, and all overhead cost was, $291,476.32. Had this amount of treatment been procured at authorized fees by employing contract dentists, the total cost would have been $941,887.96. The amount of treatment rendered by the full-time officers shows a substantial increase over last year due to better trained personnel and more convenient facilities at the stations. The major items were as follows:

Item	1931	1932
Number of patients treated	65,556	116,952
Number of sittings	131,478	203,271
X-ray exposures	21,291	39,635
Prophylactic treatment (hours)	6,175	22,726
Vincent's stomatitis treatment (hours)	3,567	6,101
Pyorrhea treatment (hours)	2,218	4,254
Extractions	43,344	71,206
Alveolectomy	954	3,685
Alloy fillings	23,518	37,355
Gold inlays	736	2,266
Porcelain crowns	91	53
Silicate cement fillings	8,211	14,261
Dentures (full and partial)	3,148	5,499
Bridges	1,342	1,876
Fracture cases (hours)	538	619
Total number of treatments rendered	335,214	585,535

In addition to the above, 4,047 patients were treated at 32 smaller stations by contract dentists on a fee basis at a total cost of $31,683. Contract treatment, which is restricted to purely emergency or routine treatment, averaged $7.82 per patient, while that performed by the full time dental officers, including all classes of treatment, averaged $2.50 per patient.

Senior Dental Surg. C. T. Messner is in charge of dental activities in the field and the bureau.

COAST GUARD

The average number of Coast Guard beneficiaries on active duty and retired was 13,189. 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
1932	13,189	91,655	198,800	11,481	6.9	15.1	.9

Twenty-four medical and dental officers are assigned exclusively to Coast Guard duty, and 103 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 South American 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, and in addition to their care of Coast Guard personnel, they 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.

The dental unit installed during the previous year at the Coast Guard depot, Curtis Bay, Md., has decisively proved its value. It is in charge of a dental officer and serves a large personnel of vessels undergoing repair, in addition to that of the depot. The same may be said of the dental unit at Coast Guard section base No. 2, Stapleton, N. Y., 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, 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, one new cutter and seven new patrol boats 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.

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.

Operating Costs

The total amount expended during the fiscal year 1932 included the equipping of the new hospitals at San Francisco, New Orleans, and Galveston.

The appropriation for 1932, $6,664,479, was augmented by reimbursements from the Veterans' Administration in the sum of $1,387,129, making a gross total available of $8,051,608. A reserve of $164,479 was set up for the year, making the net amount available for expenditure $7,887,129. Owing to the low cost of subsistence, furniture, furnishings, fixtures, and other supplies and equipment, it was possible to make an additional saving of $182,349.

144391—32——10

According to the classification used by the General Accounting Office, the several items of expense were as follows:

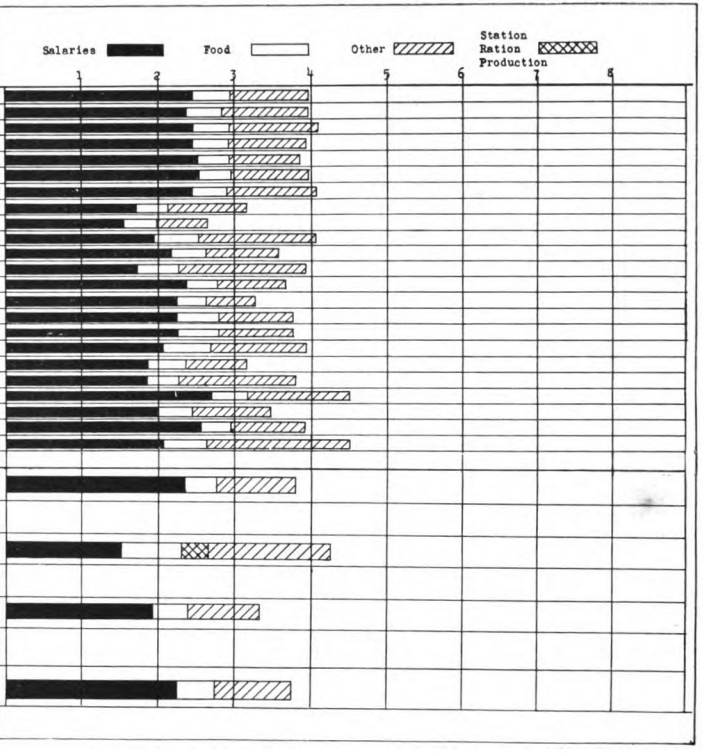
01	Personal services	$4,072,989
0200	Janitors and sundry supplies, X-ray films, etc	95,161
1210	Medical and hospital supplies	353,030
0220	Scientific and educational supplies	5,124
0230	Fuel (coal, oil, and gas)	161,815
0250	Forage	34,040
0260	Provisions	1,048,730
0280	Sundry supplies	78,238
03	Subsistence and support of persons (contract care)	537,635
04	Care of animals	59
0500	Telegrams	735
0510	Telephone	24,700
06	Travel expenses	95,430
07	Freight	126,616
10	Furnishing heat, light, power, and water	195,548
1100	Rent of buildings and offices	26,914
1110	Other rents	5,443
1280	Repairs and parts, motor vehicles	7,381
1290	Alterations and repairs, building equipment	31,831
1373	Sundry service	53,893
1375	Ash and garbage removal	1,763
1380	Miscellaneous services	3,776
2250	Burials	22,273
3000	Motor vehicles	14,593
3010	Furniture, furnishings, and fixtures	389,157
3020	Scientific equipment	259,635
3040	Livestock	421
3050	Other equipment	57,850
		7,704,780

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 150 to 157.

Marine Hospital, Baltimore, Md.—Medical Director R. H. Creel, in charge. Construction work was begun on the new marine hospital, a 6-story building of Georgian type of architecture, with 380 beds, auxiliary services, and utilities. The operation of the old hospital has created administrative difficulties incident to moving certain old wards, abolishing others, and converting to ward use structures not originally intended for hospital purposes. All beds were kept constantly filled; the average census exceeded the normal by 20 patients, the excess being cared for by beds in aisles and other places not intended for wards. An electrocardiograph was procured with competent service and the facilities were otherwise improved. Avertin was used in both surgical and dental cases as a general anesthetic, and spinal anesthesia was extensively employed in both minor and major surgical operations. Of hospital patients, 66½ per cent were merchant seamen, 11 per cent Coast Guard men, and 5 per cent patients of the Employees' Compensation Commission. Of the total in-patients, 39 per cent were surgical cases, 31 per cent medical, 29 per cent genito-urinary, and 3 per cent tuberculous. Patients of the Employees' Compensation Commission, of whom there were 400 treated and 566 given special medical examinations, involved considerably more administrative attention than other groups on account of the detailed reports to be rendered and the execution of various forms. Longshoremen cases also involved the preparation of detailed reports. Of 167 beneficiaries of the Veterans' Administration, 11 per cent were admitted for venereal disease, 11 per cent for herniae, 7 per cent, hemorrhoids, 6 per cent, lacerated wounds, 6 per cent, malignant growths, and the others for a variety of conditions such as arthritis, gastric ulcer, arterial hypertension, tonsillitis, and other minor ailments chiefly of non-service connection. There were 1,373 operations in the general surgery section

GROUP OF HOSPITALS	HOSPITAL LOCATION	RELIEF DAYS	COST PER PATIENT DAY TOTAL	SALARIES	FOOD	OTHER
GENERAL	Baltimore, Md.	71,369	$3.97	$2.47	$0.50	$1.00
	Boston, Mass.	55,091	3.97	2.38	.45	1.14
	Buffalo, N. Y.	29,763	4.10	2.47	.46	1.17
	Chicago, Ill.	55,944	3.95	2.44	.48	1.03
	Cleveland, Ohio.	88,668	3.84	2.52	.42	.90
	Detroit, Mich.	47,743	3.98	2.53	.45	1.00
	Ellis Island, N. Y.	164,274	4.07	2.44	.46	1.17
	Evansville, Ind.	23,810	3.15	1.71	.41	1.03
	Galveston, Texas.	35,890	2.65	1.54	.39	.72
	Key West, Fla.	32,267	4.07	1.94	.58	1.55
	Louisville, Ky.	27,512	3.59	2.17	.45	.97
	Memphis, Tenn.	28,073	3.91	1.71	.55	1.65
	Mobile, Ala.	32,266	3.65	2.37	.42	.86
	New Orleans, La.	158,788	3.23	2.22	.38	.63
	Norfolk, Va.	80,022	3.76	2.23	.55	.98
	Pittsburgh, Pa.	33,656	3.84	2.24	.53	1.07
	Portland, Me.	28,892	3.92	2.06	.61	1.25
	Port Townsend, Wash.	33,859	3.15	1.86	.51	.78
	St. Louis, Mo.	33,876	3.80	1.84	.40	1.56
	San Francisco, Calif.	119,953	4.51	2.68	.47	1.36
	Savannah, Ga.	58,605	3.47	1.97	.47	1.03
	Stapleton, N. Y.	106,166	3.92	2.54	.40	.98
	Vineyard Haven, Mass.	8,485	4.51	2.07	.55	1.89
	New York, N. Y. (a)					
	Per diem cost for General Hospitals		3.81	2.30	.46	1.05
	Total Relief Days	1,354,972		Cost	$5,161,601.18	
TUBERCULOSIS SANATORIUM	Fort Stanton, N. M.	84,811	3.86	1.50	.77	1.59
				Cost	$ 327,439.92	
LEPROSARIUM	Carville, La.	130,386	3.30	1.93	.45	.92
				Cost	$ 430,221.96	
ALL	Per diem cost for all hospitals		3.77	2.23	.48	1.06
	Relief days for all hospitals	1,570,169		Cost	$5,919,263.06	



(a) In-patient department of station closed.

AVERAGE PER DIEM COST OF IN-PATIENT RELIEF, UNITED STATES MARINE HOSPITALS, FISCAL YEAR, 1932

UNITED STATES MARINE HOSPITAL, BALTIMORE, MD.

UNITED STATES MARINE HOSPITAL, SAN FRANCISCO, CALIF.

exclusive of surgical procedures in the genito-urinary section, dental clinic, and eye, ear, nose, and throat department. Major operative procedures included 108 appendectomies, 133 herniotomies, 56 cystoscopies, 147 tonsillectomies, and 6 gastro-enterostomies. Sixty-four per cent of the patients were given spinal anesthesia, 24 per cent inhalation anesthesia, and 12 per cent avertin, which was used 48 times for surgical anesthesia during the year and found to be safe and satisfactory. It was usually not supplemented by either gas or ether. Spinal anesthesia was satisfactorily administered 251 times, thus following the general trend away from prolonged general anesthetics. There were 52 admissions for pulmonary tuberculosis. Two insane patients were transferred to State institutions without service obligation, and 4 were sent to St. Elizabeths Hospital.

A total of 3,852 injections of bismuth and mercury were given to syphilitic patients, and 3,801 such patients were given injections of neoarsphenamine. A routine spinal puncture was performed after the third injection of arsphenamine. Twenty-eight patients with central nervous system lues, most of them in the late stage, were treated with malarial inoculation with satisfactory results. Hyperthermia has been introduced for treatment of neurosyphilis. The dental service gave 21,526 treatments, and the physiotherapy department 14,751, the clinical laboratory performed 27,137 tests; 11,183 X-ray exposures were made, including 2,283 in the dental unit. There were 36 deaths and 15 autopsies.

The total expenditure amounted to $332,822.

Marine Hospital, Boston, Mass.—Medical Director A. D. Foster, in charge. The daily average number of patients was 151. The total admitted was 1,663, classified as follows:

Merchant seamen	803	United States Public Health Service	35
Coast Guard men	599	Coast and Geodetic Survey	16
Immigrants and alien seamen	76	Lighthouse Service	13
Employees' Compensation Commission	70	Bureau of Fisheries	5
Foreign seamen	42	All other beneficiaries	4

There were issued 1,629 permits for medicinal liquor to be used on board ship and, in cooperation with the Division of Foreign Quarantine, 2,469 port sanitary statements. Three insane patients were transferred to St. Elizabeths Hospital upon the request of relatives. Two tuberculous patients were sent to Fort Stanton. There were 7,659 surgical operations, 5,190 X-ray exposures, and 18,343 physiotherapy treatments.

The total expenditure amounted to $244,421.

Marine Hospital, Buffalo, N. Y.—Surg. Floyd C. Turner, in charge. Although shipping on the Great Lakes has declined, the normal bed capacity of 85 was often exceeded during the year. The maximum number of patients was 91 and the minimum 71. There were 4,236 surgical operations, major and minor, the more difficult being performed by the attending specialists in surgery, orthopedics, opthalmology, otorhinolaryngology, and urology; 1,979 X-ray exposures; 4,551 physiotherapy treatments; and 9,004 dental treatments. The laboratory technician has, during the past two years, trained herself for X-ray technician duties. Staff meetings, held weekly, were attended by the chief nurse, dietitians, aides, and technicians, as well as by the medical and dental staff. The educational talks to patients and others on the prevention of disease, first aid, etc., were continued, special lectures being given to Coast Guard, post office, and lighthouse personnel. The Erie County Hospital Council met twice at the marine hospital. The personnel of the marine hospital contributed to the local joint charities fund 203 per cent over the quota expected of them. A national hospital day program was carried out in cooperation with local hospital agencies.

A new method of treatment for peptic ulcer with mucin was used, with good clinical results. The State hospital for the insane furnished malarial blood and professional advice in the care of cerebrospinal syphilitics. Investigation was made of the method of treating gonorrhea by diathermy, and laboratory arrangements were completed for growing maggots for the treatment of chronic osteomyelitis. Upon request, 2 mentally disturbed patients and 6 others with chronic ailments were delivered into the custody of relatives; 3 others needing chiefly custodial care were placed in local institutions without service obligation.

The total expenditure amounted to $139,714.

Marine Hospital, Carville, La. (the National Leper Home).—Surg. O. E. Denney, in charge. The average number of patients was 356, the normal working capacity of the institution, as it has been necessary to devote a number of cottages

to infirmary use. Eighty patients were admitted, the largest number in the history of the hospital; of these 64 were new, 2 were paroled patients who had relapsed, 9 were paroled patients who returned for a brief period of observation, and 5 were returned absconders. Of the general group, 20 died, 2 were deported by the Bureau of Immigration, 4 absconded (1 of these returned), and 26 were discharged, leprosy arrested and no longer a menace to public health. Twenty-four States, 4 insular possessions, and 20 foreign countries are represented in the nativity of patients, the greatest frequency of admissions being, in the order named, from the States of Louisiana, Texas, Florida, and California. Intramuscular injections of chaulmoogra oil-benzocaine were given as routine treatment twice a week to 172 patients, the average dose being 5 cubic centimeters, and 185 patients are taking chaulmoogra oil by mouth in doses of from 5 to 50 drops three times daily, the maximum dose attained being 125 drops three times a day. Injections given during the year included—

Benzocaine-chaulmoogra oil (intramuscularly)	9,760
Ethyl esters of hydnocarpus	402
Bismuth salicylate	68
Neosalvarsan (intravenously)	78
Calf serum (intradermal)	36
Smallpox vaccine (intradermal)	190
Mercurochrome (intravenously)	30
Others	60
Total	10,624

Several new experimental treatments were essayed without significant results, including the use of erysipelas streptococcus antitoxin intramuscularly in doses averaging 10 cubic centimeters. Intramuscular injections of the ethyl esters of chaulmoogra oil and of the hydnocarpus were continued to a diminishing number of patients. It seems evident that neither of these ethyl esters is specific for leprosy, although they may be of benefit in somewhat the same way that cod-liver oil is in tuberculosis. A technique is being worked out for the systematic administration of arsenic by mouth in such a way as to eliminate the danger of arsenical keratosis of the palms and soles. Seventy patients whose blood serum contained low diffusible calcium, even though the total calcium was normal, were treated with viosterol with encouraging clinical results.

The attending specialist in eye, ear, nose, and throat visits the hospital weekly and holds a clinic, with an average attendance of two-thirds of the total patients. He performed 146 specialistic operations and supplied corrective refractions for 89 patients. The attending specialist in neuropsychiatry was consulted in 246 instances and examined 165 patients. Of 12 psychopathic patients now under treatment, 5 are confined in the psychopathic ward. The attending specialist in orthopedics treated 321 patients; preventive treatment of deformities such as those due to tendon contractions is considered very important. The dental officer gave 3,213 treatments to leper patients. The laboratory has cooperated with the Division of Scientific Research; a full-time bacteriologist was added to the staff to attempt to correlate results in the culture of acid-fast bacilli encountered in lepers. A report on the comparative behavior in the presence of rabbit leucocytes of 50 acid-fast bacilli obtained culturally from lepers is being published in the Archives of Dermatology and Syphilology. The bacterioscopic examination of patients and reexamination of paroled patients occupied considerable time, an average of 100 patients being examined monthly. Sixteen autopsies were performed (80 per cent of deaths), and the gross and histologic findings were added to the permanent clinical records. In the X-ray department a special technique for soft tissue delineation was developed to show leprous skin lesions.

The station dairy produced all milk and cream consumed at a cost of approximately $7,500 less than market delivery prices. Five carloads of beef cattle and hogs were shipped from Fort Stanton, N. Mex., and slaughtered on the station at an estimated saving of $2,000 under purchase price. By station labor, canvas awnings on 560 windows in patients' cottages were replaced by permanent awnings of corrugated asbestos shingles attached to cypress frames. Landscaping was continued by the station force. The patients' outdoor recreation facilities include a golf course, baseball diamond, and tennis and soccer ball courts. The Sixty-Six Star, published by a group of resident patients, contributes materially to the interest and enjoyment of the clientele. Sound pictures have been successfully introduced for the biweekly entertainments. Banking transactions amounting to $29,295.85 were handled for the patients with a local bank.

The Association of Military Surgeons, the American Society of Clinical Pathologists, and the American Medical Association sent large delegations to visit the hospital, where demonstration clinics were held by the resident and visiting staff for their benefit.

The total expenditure amounted to $459,399.

Marine Hospital, Chicago, Ill.—Medical Director J. W. Trask in charge. Although a smaller number of boats is actively engaged in lake shipping than in normal times, the number of seamen patients has at all times kept close to the hospital bed capacity and sometimes exceeded it. There were 12,298 dental treatments, representing a considerable increase over last year with the same personnel, and 5,497 surgical operations were performed. The clinical laboratory work has been extended and its facilities have been improved and effectively coordinated with the medical service; 12,844 examinations were made. With the view of facilitiating diagnosis and reducing the duration of hospital care the use of X ray has been extended; 4,948 Röntgenograms were made. The physiotherapy department gave 12,031 treatments. There were 32 deaths and 11 autopsies.

The total expenditure amounted to $267,696.

Construction has commenced on the new hospital wing and other hospital buildings, which are to be completed about July 1, 1933.

Marine Hospital, Cleveland, Ohio.—Medical Director L. P. H. Bahrenburg in charge. The building program and landscaping of the reservation were completed. In spite of temporary recession in lake shipping, the activities of the hospital have increased. Owing largely to the policy of giving the maximum number of beds to the Veterans' Administration, the hospital census has seldom fallen below 240 and several times reached 268. A total of 1,413 patients were treated for medical conditions and 942 in the surgical section, where 4,969 surgical operations were performed. The dental department furnished 20,478 treatments, including 2,690 extractions and 2,032 fillings, and made 246 dentures. The dental officers have continued to take practically complete charge of all jaw-fracture cases, of which 11 were treated during the year. A total of 27,340 tests were made in the clinical laboratory, including 5,683 Wassermann and Kahn tests, 4,734 blood cell counts, 7,358 urinalyses, and 2,313 sputum examinations. There were 105 deaths, 87 among beneficiaries of the Veterans' Administration, and 69 autopsies. Physiotherapy treatments numbered 15,623, and 9,548 Röntgenograms were made.

The total expenditure amounted to $361,364.

Marine Hospital, Detroit, Mich.—Surg. J. H. Linson in charge. The hospital was filled to capacity throughout the year with an average of 130 patients; the minimum was 116 on July 26, 1931, and the maximum 140 on October 26, 1931. A strip of land adjoining the hospital reservation, needed to complete the building program, was condemned and occupied by the Government, and construction was begun on the additional hospital buildings, consisting of a 100-bed wing, quarters for officers, nurses, and attendants, a storeroom, and a laundry. Nearly half the hospital patients are veterans, to whom, owing to the depression in shipping, it has been possible to assign an unusual number of beds. Slightly more than 76 per cent of the out-patients were merchant seamen and other old-line nautical beneficiaries. There were 13,741 dental treatments, of which more than half were for out-patients, and 13,197 physiotherapy treatments. There were 65 deaths and 43 autopsies.

The total expenditure amounted to $199,993.

Marine Hospital, Ellis Island, N. Y.—Medical Director C. H. Lavinder in charge. Although 42 per cent of admissions to this hospital were detained immigrants or outgoing aliens, 85 per cent of the hospital relief furnished was for merchant seamen and other old-line beneficiaries, because immigrants are usually detained for only a few days whereas merchant seamen are treated for long periods. The average number of patients was 448 and the maximum number 524. It is necessary to hold certain wards in reserve for various classes of immigrants and mental, contagious, and other cases.

A cardiac clinic has been established which examines from 70 to 80 per cent of all patients admitted. In the genito-urinary service, which handles the largest number of patients treated, some research was done in the treatment of various kinds of ulcer with metallic dusting powders; the use of sero-vaccine developed at the station was continued in the treatment of gonorrheal urethritis and its complications; in the treatment of syphilis of the central nervous system and certain of the complications, nonspecific protein fever therapy supplemented routine treatment; and general thermotheraphy has been introduced. The average number of patients in the tuberculosis wards was 124, and the average number

of these undergoing pneumothroax treatment was 26; 774 refills were made. The psychopathic and neurological department has been expanded. Post-traumatic lesions and neurosyphilis comprise the majority of neurological cases, and an average number of 30 insane patients are under treatment. In the nose and throat clinic, 6,623 examinations and treatments were given and 368 operations performed, chiefly tonsillectomies, submucous resections, and sinus drainage. The physiotherapy department gave 15,249 treatments; the dental department 25,848 treatments; 8,236 X rays were made, and 36,156 laboratory examinations performed. There were 87 deaths and 56 autopsies. Convalescent care was furnished without expense to the service to 112 patients; 461 convalescents were given lodging and meals for periods of more than one week by various seamen agencies, and 134 others were furnished with temporary care. Work was obtained for 93 patients, 327 were furnished with necessary clothing, and aid of various kinds was rendered to 2,477 patients through the collection of wages, legal advice, attention to baggage, or contact with relatives. Assistance was furnished through the New York chapter of the American Red Cross and also from a special fund collected for seamen in the port of New York by a committee of welfare agencies. With this assistance from private agencies the hospital has played no small part in the relief of sick and destitute seamen in the port.

The total expenditure amounted to $705,893.

Marine Hospital, Evansville, Ind.—Surg. Lynne A. Fullerton in charge. The rated capacity of this hospital, 54 beds, has been constantly exceeded, and at times 76 patients were in hospital. About two-thirds of the patients were veterans, a great many of whom were suffering from emergency surgical conditions. Of 5 insane patients, 2 were transferred to St. Elizabeths Hospital, Washington, D. C., 2 were committed to the Evansville State Hospital for the Insane, and the care of 1 was assumed by the Veterans' Administration.

The total expenditure amounted to $83,224.

Satisfactory progress is being made with the construction of a 3-story brick building containing kitchen and dining rooms; surgical and dental operating rooms; X ray, physiotherapy, and laboratory facilities; and wards and private rooms for 30 beds. It is anticipated that the new building will be ready for occupancy about April 1, 1933.

Marine Hospital, Fort Stanton, N. Mex.—Surg. R. L. Allen in charge. Ninety-four per cent of patients admitted here are merchant seamen or other old-line beneficiaries. The daily average number of patients under treatment was 232. Of 84 tuberculous patients discharged, 11 had disease arrested or apparently arrested, 50 were improved, 14 unimproved, and 9 died. The low death rate is ascribed to a more careful selection of patients transferred to Fort Stanton and to intensive treatment, particularly pneumothorax (30 patients with 1,143 refills), phrenic exeresis (50 patients), dentistry, oleotheraphy, heliotherapy, Sauerbruch diet, and insulin for malnutrition. Occupational therapy is a valuable adjunct to treatment; 86 patients were given instruction in leather work, weaving, and various crafts. The superintendent of education of the State of New Mexico furnished correspondence courses to the patients, 41 enrolling. The average stay of tuberculous patients discharged, and fatal cases, was 838 days.

Patients approaching fitness for discharge are given paid employment to test their recovery; 24 were employed as attendants and 25 others engaged in gainful private occupation, the total estimated earnings amounting to $12,000. The new sound picture equipment operates satisfactorily and is a great source of pleasure to the ambulatory patients, for whom two entertainments are given weekly. The radio is the principal source of entertainment for the infirmary patients, all of whom have headsets. Acknowledgements are due the Trowel Club, Seamen's Church Institute, Christmas Committee, and other organizations generously providing recreation of various kinds. A Catholic and a Protestant chaplain living at the sanatorium provide regular religious services and administer to the spiritual needs of the sick and dying.

The production of milk, beef, and pork on the station farm has been continued, but limited strictly to the needs of the sanatorium and to those of the National Leper Home, to which five carloads of cattle and hogs were shipped during the year.

The total expenditure amounted to $358,062.

Marine Hospital, Galveston, Tex.—Surg. Joseph Bolten in charge. This new hospital was occupied on November 16, 1931. In addition to the main hospital building with attached wing for kitchens and laundry, there are nurses' quarters, attendants' quarters, one single and two double sets of officers' quarters, a recreation building, and a garage. On January 1, 1932, the rated capacity of 100 beds

was exceeded, and during the last four months of the year the number of patients has ranged between 165 and 175; the greatest number under treatment at one time was 195. By utilizing the large porches which extend the full length of each ward, overcrowding has been avoided. Approximately one-third of the patients are beneficiaries of the Veterans' Administration. The outpatient office has been continued in the post office building down town. Port sanitary statements, 3,510 in number, were issued to 988 ships.

In addition to the resident staff there are 13 attending specialists devoting from one hour per week to four hours per day to hospital duties. A full-time dental officer, with a dental hygienist to assist, furnished 9,469 treatments. The physiotherapy department gave 5,706 treatments. The laboratory is well equipped; a full-time technician performs practically all work except tissue examinations, which are sent to the National Institute of Health. The X-ray work is done by an experienced technician, supervised by an attending specialist in Röntgenology who devotes from two to three hours daily, five days per week, to this work. Deep X-ray therapy and radium treatment are furnished at the office of the attending specialist.

Landscaping has not been completed although through the courtesy of friends, shrubbery and trees, and flower seeds were obtained and planted.

The total expenditure amounted to $192,141.

Marine Hospital, Key West, Fla.—Surg. M. S. Lombard in charge. The hospital annex building, a 3-story structure, communicating at each floor level with the main building, was completed by contract and occupied in March, 1932, increasing the capacity of the institution to 100 beds and providing a large recreational hall, the benefit of which in this isolated community was soon evidenced by the favorable psychological effect on ambulatory patients. At the request of the Veterans' Administration to provide additional beds for colored patients, an extension to the colored ward was also built by station labor and occupied on June 30, 1932, adding 12 beds and giving a total ward capacity of 112. A small outbuilding was also converted into a much needed isolation ward containing two small bedrooms, a toilet, and a glass-inclosed porch, comfortably housing a patient and special attendant. The need for an isolation ward is evidenced by the fact that one case of acute poliomyelitis and two cases of smallpox were admitted during the year. The salt-water supply system was improved, and the quantities of rain water were increased by properly guttering the hospital buildings, thus diminishing the considerable expense of purchasing fresh water which, on this island, must necessarily be either rain or distilled water.

The hospital continued to operate at full capacity, the greatest number of patients, 115, being in hospital on June 15, 1932. The majority of patients are from the Veterans' Administration, but old-line beneficiaries are sent from Tampa, St. Petersburg, Miami, and Fort Lauderdale. There were 366 major surgical operations and 1,965 minor operations. The dental officer furnished 9,068 treatments. The laboratory made 3,592 examinations, and 3,498 X-ray exposures were made. Three cases of leprosy were diagnosed clinically for the Florida State Board of Health. Progress was made in beautifying the grounds, for assistance in which project and other matters acknowledgment is made to the Navy Department.

The total expenditure amounted to $147,412.

Marine Hospital, Louisville, Ky.—Medical Director J. S. Boggess in charge. To replace this hospital, which was built in 1848 and has a bed capacity of 83, a new 100-bed hospital building is being constructed on the grounds which will be completed in the spring of 1933. The old hospital building will then be converted into quarters which are at present lacking for nurses and certain other personnel.

The resident staff is supplemented by attending specialists from the city. The attending specialist in surgery examined 823 patients and operated upon 163; the attending specialist in internal medicine examined 471; the attending specialists in orthopedic surgery; urology; eye, ear, nose, and throat; neuropsychiatry, and dermatology examined, operated upon, or otherwise served a considerable number of patients.

The total expenditure amounted to $110,516.

Marine Hospital, Memphis, Tenn.—Surg. W. H. Slaughter in charge. The normal capacity of 65 patients was constantly exceeded, and at one time 90 patients were under treatment. To relieve overcrowding it was necessary to transfer 24 patients to the marine hospital in New Orleans and a few others to Louisville and at times to house convalescent patients of the Employees' Compensation Commission in local hotels. There were 1,844 surgical operations and 3,493 clinical laboratory tests; Wassermann tests were made on all patients admitted to hospi-

tal. One insane and one tuberculous patient and two others requiring custodial care only were admitted to local public institutions without service obligation. Plans have been completed for the new hospital building upon which construction will begin shortly.

The total expenditure amounted to $130,553.

Marine Hospital, Mobile, Ala.—Surg. W. S. Bean in charge. A decline in the shipping of the port from 773 vessels in 1931 to 758 in 1932 has been reflected in the total number of patients, which fell from 3,538 to 3,405. The hospital has maintained a capacity of 90 beds, and the daily average of patients has been slightly more than 88. Only one case of mental disease was admitted during the year which required indefinite hospitalization, and the patient was admitted to the Alabama State Hospital as a beneficiary of the State. Among the admissions to hospital were 4 patients with typhoid fever, 20 with malaria, 100 with syphilis, and 129 with gonorrhea. The clinical laboratory made 13,813 examinations; the X-ray department, 1,858 exposures; and dental treatments totaled 9,454, of which more than half were for out-patients. There were 5,646 physiotherapy treatments.

The total expenditure amounted to $129,152.

Work was commenced on the additional hospital buildings on March 10, 1932, and such satisfactory progress made that it is anticipated that new construction will be completed about May 1, 1933.

Marine Hospital, New Orleans, La.—Surg. T. B. H. Anderson in charge. The outstanding event during the past fiscal year was the opening of the new hospital containing 568 beds, to which transfer of patients from the old buildings was completed December 1, 1931. It is completely equipped with every facility required for the care of our beneficiaries. Experience shows that the phsyical arrangements of the buildings are excellent in every way, as demonstrated by the fact that almost all space has been utilized for the purpose for which it was planned. Five double sets of officers' quarters, a nurses' home, and quarters for internes were also completed and occupied during the year, thereby effecting a considerable saving. Construction has begun on attendants' quarters, storerooms, and garages, which, together with roadways and landscaping, was necessarily deferred until completion of the main hospital building permitted demolition of the old wards.

The quality of professional work has improved with the new facilities without important change in the per diem cost of operation. The Orleans Parish Medical Society held one of its meetings in the hospital, the program being given by the hospital staff. An extensive clinical meeting was held for members of the Association of Military Surgeons at their December meeting in New Orleans. The hospital has carried out research work by testing preparations for the National Institute of Health, by supplying blood infected with quartan malaria to service officers, and has instituted treatment with artificial temperatures obtained by diathermy on certain patients suffering from central nervous system lues and chronic arthritis. Aid has been given to a medical officer detailed to the local Federal penitentiary in such matters as emergency dental treatments and the occasional admission of patients for major surgical operations.

The following is a summary of work done during the year:

Hospital patients treated	4,410
Hospital days	158,795
Deaths	120
Autopsies (72.5 per cent)	87
Operations, surgical operating room	1,252
Doses of salvarsan	5,748
Spinal punctures	310
Operative procedures (urological service)	6,398
Treatments (eye, ear, nose, and throat clinic)	8,978
Operations (eye, ear, nose, and throat clinic)	370
Refractions (eye, ear, nose, and throat clinic)	314
Treatments (dental clinic)	48,619
Examinations (dental clinic)	5,622
Treatments (physiotherapy department)	19,318
Examinations (clinical laboratory)	51,664
Exposures (Röntgenology department)	12,371
Consultations with specialists	3,931
Out-patient treatments: Medical, 19,401; dental, 10,374	29,775
Men instructed and examined in first aid	176
Number of liquor and narcotic permits issued	160

Of 12 insane patients it was necessary to transfer only 1 to St. Elizabeths Hospital, 7 were turned over to State or city or Veterans' Administration hospitals, 1 to the immigration authorities, and 3 were released at the request of relatives for home care.

The total expenditure amounted to $682,595.

Marine Hospital, Norfolk, Va.—Surg. S. L. Christian in charge. The hospital operated to capacity throughout the year, the great majority of patients being merchant seamen, whose average stay was 5.3 days longer than in 1931 because convalescents are loath to leave until they are able to work, especially during periods of unemployment. The Veterans' Administration continued to use all beds that could be made available for its patients. Six tuberculous merchant seamen were transferred to Fort Stanton, 1 insane patient was sent to St. Elizabeths Hospital, and 1 was discharged to the custody of his wife; and 2 tuberculous veterans and 1 insane veteran were transferred to Veterans' Administration hospitals. There were 65 deaths and 35 autopsies. Weekly staff meetings were held and attended by all medical and dental officers. The Norfolk Medical Society held a meeting at the hospital for which a surgical program was furnished by the resident staff. The use of oxygen was continued in the treatment of pneumonia and also other conditions such as asthmatic bronchitis and cardiac and Bright's disease. The controversial question of the use of arsenicals in the treatment of syphilitic heart disease is being investigated. Surgical operations numbered 4,915; in the genito-urinary department sitz baths are extensively used and considered indispensable in the armamentarium of this department; 2,043 intravenous injections for syphilis were given. The clinical laboratory made 16,325 examinations, including 958 tissue examinations, of which some were immediate frozen sections for the surgical service; Kahn tests are now run simultaneously with Wassermann tests, of which there were 2,740; 346 examinations for the determination of the icterus index were made. There were 9,555 Röntgenograms made on 2,213 patients, and 21,459 dental treatments, which included 1,669 extractions and the making of 115 dentures. Radium and deep X-ray therapy are obtainable by contract. The chaplain held 45 devotional services and supervised all burials. He also provided 24 entertainments and procured flowers, fruits, and many books and magazines for the patients. Four narcotic permits and 125 liquor permits were issued to ships. In cooperation with quarantine, 2,623 bills of health were issued.

The total expenditure amounted to $345,751.

Tile floors and wainscoting were laid in 4 hallways and 54 bathrooms; toilets; diet kitchens; and dressing, sterilizing, and utility rooms. Foundation piles and excavation for certain new hospital buildings were completed; construction will begin shortly on the extension to the hospital, for which plans have been completed.

Marine Hospital, Pittsburgh, Pa.—Surg. Ralph E. Porter in charge. The daily average number of patients in the hospital during the year was 92, which is the rated capacity of the hospital. The maximum and minimum numbers were 101 and 86 on July 4, 1931, and April 16, 1931, respectively. More than half the patients are Veterans' Administration beneficiaries. There were 2,508 surgical operations, 5,107 dental treatments, and 2,451 X-ray exposures. Eight attending specialists supplement the resident staff.

The total expenditure amounted to $143,429.

Marine Hospital, Portland, Me.—Senior Surg. J. R. Ridlon in charge. The hospital has been filled to extreme capacity during the entire year, nearly 50 per cent of the patients being beneficiaries of the Veterans' Administration. Local consultants are attached to the staff and freely used in their specialties. There were 987 surgical operations, 5,536 physiotherapy treatments, 5,680 laboratory examinations, and 2,402 X-ray exposures. Five insane patients were referred to the custody of relatives. The interior of all wards was repainted.

The total expenditure amounted to $121,741.

Marine Hospital, Port Townsend, Wash.—Surg. O. H. Cox in charge. Owing to a slump in shipping, the number of admissions fell from 802 in 1931 to 753. There was an increase, however, in patients of the Employees' Compensation Commission. One merchant seaman needing domiciliary care was transferred to Sailors' Snug Harbor, and four insane patients were sent to the contract hospital at Portland, Oreg. The surgical service was active. Spinal anesthesia was administered 179 times and, with regional-local, has largely replaced general anesthesia. The Department of the Interior has requested the transfer of this hospital to the Bureau of Indian Affairs upon completion of the new marine hospital in Seattle.

The total expenditure amounted to $113,837.

Marine Hospital, St. Louis, Mo.—Surg. D. J. Prather in charge. Despite the handicap of old buildings and insufficient space for utilities the hospital had a busy year. The great majority of patients were merchant seamen and other old-line beneficiaries. Patients of the Employees' Compensation Commission are being treated in increasing numbers, and the Veterans' Administration continues to utilize all beds not otherwise needed. There were 1,165 surgical operations, 1,694 X-ray examinations, and 3,029 clinical laboratory tests. A complete dental clinic was supplied and a commissioned dental officer detailed to the station. New hospital buildings are needed here to improve the facilities and remove fire hazards.

The total expenditure amounted to $152,472.

Marine Hospital, San Francisco, Calif.—Medical Director M. J. White in charge. The new hospital building of 472 beds was occupied November 6, 1931, by the transfer on that date of 273 patients from the old hospital buildings. Overcrowding having been relieved, the number of patients gradually increased to 338 at the end of the fiscal year. The old frame hospital buildings, 17 in number, were promptly demolished, thus removing a serious fire hazard. Work was commenced on the recreation building and quarters, and a new roadway was built from Park Presidio Avenue entrance and Fourteenth Avenue entrance up to and around the new hospital. There were 106 deaths and 65 autopsies. Seventy-four tuberculous patients were admitted, of whom three were transferred to Fort Stanton. There were 222 in-patient and 543 out-patient syphilitics, 384 in-patient and 2,920 out-patient gonorrheal patients, and 31 cases of carcinoma. Acknowledgment is due the Seamen's Church Institute for recreational work carried on in the usual helpful and satisfactory manner.

The total expenditure amounted to $795,725.

Marine Hospital, Savannah, Ga.—Medical Director J. T. Burkhalter in charge. The hospital continued to function beyond normal capacity throughout the year, chiefly on account of urgent demand from the Veterans' Administration. The average number of patients of all classes was 161—the minimum and maximum, 138 and 181, respectively. A large number of seriously ill patients were admitted to hospital. There were 49 deaths and 22 autopsies. Monthly staff meetings were held to discuss administrative and professional subjects and particularly cases with obscure symptoms. There were 10,020 dental treatments, 22,321 laboratory examinations, 5,034 X-ray examinations, 5,652 surgical operations, and 12,219 physiotherapy treatments. The dental clinic was enlarged; diet kitchen improved and enlarged; a new dining room for nurses provided; and the hospital grounds were beautified by the planting of trees, shrubs, etc.

The total expenditure amounted to $225,679.

Marine Hospital, Stapleton, N. Y.—Medical Director M. H. Foster in charge. The hospital has at present a capacity of less than half the number of regular beneficiaries receiving hospital treatment in the port, the excess being sent to Ellis Island. More than 90 per cent of the patients admitted are merchant seamen or members of the Coast Guard. Plans for the new hospital, affording approximately 500 additional beds, have been completed, and it is expected that construction will begin shortly. The necessary land adjoining the present reservation has been purchased. Fifty-seven per cent of patients admitted were surgical cases. The total number of surgical operations performed was 3,172; 1,315 anesthesias were given, of which 730 were spinal. No case of spinal anesthesia terminated fatally or exhibited dangerous complications. A follow-up system of surgical cases and selected medical cases has been instituted.

There were 4,311 dental examinations and 27,588 dental treatments; 59 fractures of the jaw were handled by the dental officers. The physiotherapy department furnished 34,502 treatments; the X-ray clinic made 10,842 exposures; the pathological laboratory performed a total of 22,574 tests. Special research in venereal disease was continued throughout the year, bearing particularly on the transmission of syphilis and the value of prophylactic measures. A study was also begun of the effects of high frequency oscillating currents on animals.

The total expenditure amounted to $452,201.

Marine Hospital, Vineyard Haven, Mass.—Passed Asst. Surg. Frank F. Thweatt, jr., in charge. This small hospital, with a normal bed capacity of 24, has been practically filled during the entire year with merchant seamen, Coast Guard men, and occasional patients from the Employees' Compensation Commission and the Veterans' Administration. Only one medical officer is on duty, and patients requiring highly specialized treatment are transferred to the marine hospital, Boston. The Seamen's Bethel, Vineyard Haven, performs social service work; a religious service is conducted each Sunday by the chaplain of the local branch. A new sewage disposal system was installed during the year.

The total expenditure amounted to $42,326.

Out-Patient Office, New York, N. Y.—Surg. P. M. Stewart in charge. This station is operated as an out-patient office with substations at the barge office, post-office building, on Thirty-third Street, and the Seamen's Church Institute, 25 South Street. An office for issuing liquor permits is also maintained at the customhouse. Some new equipment was procured in the physiotherapy department, and an additional treatment room was provided in the genito-urinary clinic. The Supervising Architect has made contracts for installing two new heating boilers and remodeling and repairing roofs, pent houses, skylights, and chimneys. The interior of the hospital building is being repainted. The total number of treatments increased over the preceding year. The daily average number of treatments was 599; the maximum was 877. There were 22,272 X-ray exposures; 2,262 X-ray treatments; 11,846 clinical laboratory examinations; 51,352 dental treatments; 10,128 eye, ear, nose, and throat treatments; 48,077 physiotherapy treatments; and 6,864 antisyphilitic injections. Liquor permits issued to ships numbered 844, and purchase orders for narcotics, 61; 535 applicants for license were instructed and examined in first-aid procedures, to which 736 hours were devoted by the medical officers assigned. Three patients in need of custodial care were assisted to obtain entrance to eleemosynary institutions.

Relief Station, Manila, P. I.—Surg. R. W. Hart in charge. Beneficiaries were furnished out-patient relief at the ports of Manila, Cebu, and Iloilo, and hospital relief at the port of Manila. All treatment was rendered by service officers detailed to the Philippine quarantine service in addition to their duties as quarantine officers. For applicants for positions as officers in the merchant marine of the Philippine Islands, 346 physical examinations were made, and all students in attendance at the Philippine Nautical School were examined, especially for visual defects and color sense. Forty-two examinations were made for the Veterans' Administration and 51 for the Bureau of Pensions.

Relief Station, San Pedro, Calif.—Surg. H. E. Trimble in charge. Medical relief work is combined with quarantine activities and medical inspection of immigrants, in rented quarters near the water front. The principal beneficiaries are merchant seamen and Coast Guard personnel. Thirty-five patients were transferred to the marine hospital in San Francisco. Twenty-four-hour radio service was maintained to furnish medical advice upon request from ships at sea. Five hundred and seventy-three applications for medicinal liquor aboard vessels were approved.

Relief Station, Washington, D. C.—Senior Surg. R. M. Grimm in charge. Patients of the Employees' Compensation Commission comprise 90 per cent of the total treated at this station. The conditions treated are for the most part of a surgical nature. A very large number of physical examinations are also made, chiefly for applicants and employees of the Civil Service Commission. New X-ray equipment was procured and additional apparatus furnished for the eye, ear, nose, and throat clinic and physiotherapy department. On January 1, a medical officer was assigned to supervise first-aid relief in the new Department of Commerce building, where between January 1 and June 30, 327 patients, injured in the performance of their duty, received treatment.

Supply Station, Perry Point, Md.—Asst. Pharmacist R. D. Kinsey in charge. Through the courtesy of the Veterans' Administration the supply station is housed in two large warehouses; heat, light, and water and two sets of quarters for the officer in charge and his assistant being supplied. Nine other persons are employed. The principal issuing transactions are shown below:

Stations	Number of packages shipped	Weight	Value of purchased stock	Value of surplus stock	Total value
		Pounds			
Marine hospitals	7,430	587,396	$84,270	$60,290	$144,560
Relief stations	703	33,522	4,365	2,764	7,129
Quarantine stations	196	19,743	179	7,985	8,164
Foreign stations	38	551	139	43	182
Scientific research stations	32	1,335	81	607	688
Surgeon General's Office	22	59	29	11	40
Coast Guard	1,303	54,914	8,899	5,629	14,528
Lighthouse Service	88	1,409	151	189	340
Other Government stations (surplus only)	115	19,858	----------	17,058	17,058
Penal institutions	507	45,573	3,728	4,597	8,325
Miscellaneous	8	38	5	600	605
Total	10,442	764,398	101,846	99,773	201,619

Fifty-seven additional items were exhausted during 1932 from the war surplus stock, shipments of which were valued at $99,773, as compared with $139,290 in 1931. Expenditures will necessarily increase as the surplus stock becomes exhausted.

A saving of $1,572 was effected in personal services and important economies for the marine hospitals and other relief stations were accomplished by the manufacture of simple stock preparations and by the repair of used equipment reissued on requisitions. A contract was made for resharpening detachable scalpel blades which, when used, are received from field stations and replaced with new or resharpened blades, and a saving of $100.14 was thus effected by the use of 222 dozen resharpened blades. Of equal importance is the fact that, partly as a result of the practice, the price of scalpel blades has been reduced from $1.27½ to 85 cents per dozen.

Consolidated and Detailed Reports

The following tables give consolidated and detailed reports for the marine hospitals and relief stations:

Table 1.—*Number of patients treated annually, 1868 to 1932* [1]

Fiscal year	Sick and disabled patients furnished relief	Fiscal year	Sick and disabled patients furnished relief	Fiscal year	Sick and disabled patients furnished relief
Prior to reorganization:		After reorganization—Continued.		After reorganization—Continued.	
1868	11,535	1890	50,671	1912	51,078
1869	11,356	1891	52,992	1913	50,604
1870	10,560	1892	53,610	1914	53,226
After reorganization:		1893	53,317	1915	55,782
1871	14,256	1894	52,803	1916	58,357
1872	13,156	1895	52,643	1917	64,022
1873	13,529	1896	53,804	1918	71,614
1874	14,356	1897	54,477	1919	79,863
1875	15,009	1898	52,709	1920	110,907
1876	16,808	1899	55,489	1921	144,344
1877	15,175	1900	56,355	1922	153,633
1878	18,223	1901	58,381	1923 [2]	126,956
1879	20,922	1902	56,310	1924	159,686
1880	24,860	1903	58,573	1925	204,944
1881	32,613	1904	58,556	1926	245,140
1882	36,184	1905	57,013	1927	249,973
1883	40,195	1906	54,363	1928	240,592
1884	44,761	1907	55,129	1929	260,552
1885	41,714	1908	54,301	1930	279,350
1886	43,822	1909	53,704	1931	259,364
1887	45,314	1910	51,443	1932	257,208
1888	48,203	1911	52,209		
1889	49,518				

[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; 1931, 9,278; and 1932, 9,667.

[2] In this year, and subsequently, 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*

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1932	Number of days relief in hospital	Number of patients furnished office relief	Number of timec office relief was furnished	Number of physical examinations
Grand total	266,875	45,030	1,211	4,858	1,734,508	221,845	972,110	76,179
FIRST CLASS STATIONS								
Marine hospitals								
Baltimore, Md	8,284	1,909	35	192	71,369	6,375	43,442	2,623
Boston, Mass	7,980	1,810	32	137	55,091	6,170	29,882	4,197
Buffalo, N. Y	3,592	797	39	76	29,763	2,795	16,870	1,706
Carville, La	1,015	417	20	366	130,386	598	1,131	
Chicago, Ill	29,860	1,121	32	144	55,944	28,739	72,799	882
Cleveland, Ohio	5,548	2,351	105	256	88,668	3,197	28,325	666
Detroit, Mich	3,277	1,239	65	125	47,743	2,038	14,114	1,049
Ellis Island, N. Y	5,054	4,809	87	457	164,274	245	17,401	167
Evansville, Ind	513	412	20	62	23,810	101	226	49
Fort Stanton, N. Mex	1,325	330	13	230	84,811	995	3,501	65
Galveston, Tex.[1]	3,014	1,149	16	182	35,890	1,865	8,139	883
Key West, Fla	1,469	795	19	111	32,267	674	4,439	76
Louisville, Ky	1,166	849	31	74	27,512	317	1,455	643
Memphis, Tenn	2,754	705	11	70	28,073	2,049	11,456	1,91
Mobile, Ala	3,487	825	32	82	32,266	2,662	8,366	1,941
New Orleans, La	12,079	4,408	121	500	158,788	7,671	29,755	2,622
New York, N. Y	30,264					30,264	179,675	12,942
Norfolk, Va	8,607	2,302	65	222	80,022	6,305	29,431	1,440
Pittsburgh, Pa	2,336	726	37	96	33,656	1,610	8,508	383
Portland, Me	1,563	709	16	78	28,832	854	6,868	284
Port Townsend, Wash	1,245	847	38	82	33,859	338	1,015	60
St. Louis, Mo	1,835	499	35	90	33,876	1,336	6,142	1,302
San Francisco, Calif	12,544	3,281	106	338	119,933	9,263	49,523	2,175
Savannah, Ga	3,828	1,512	49	174	58,605	2,316	3,205	2,007
Stapleton, N. Y	8,744	3,849	65	291	106,166	4,895	24,119	701
Vineyard Haven, Mass	315	164	6	23	8,485	151	324	16
Contract overflow hospitals	117	117	9	35	14,053			
Total	161,815	37,932	1,104	4,433	1,584,222	123,883	606,111	40,797
SECOND AND THIRD CLASS STATIONS								
Aberdeen, Wash	199	20	1	1	218	179	360	143
Albany, N. Y	139	12	1	1	138	127	635	232
Anacortes, Wash	250	28		1	159	222	688	30
Apalachicola, Fla	68	10			137	58	168	2
Ashtabula, Ohio	236	26	1	2	281	210	688	25
Astoria, Oreg	485	70	1	2	657	415	1,036	53
Balboa Heights, Canal Zone	571	177	4	6	2,213	394	442	
Bangor, Me	47	6			74	41	64	45
Beaufort, N. C	835	147	1	4	1,746	688	4,076	26
Bellingham, Wash	296	18			183	278	1,032	416
Biloxi, Miss	833	41	1		256	792	2,763	81
Boothbay Harbor, Me	27	9	1		143	18	31	11
Brunswick, Ga	47	3			30	44	65	15
Burlington, Iowa	24	9			224	15	26	
Cairo, Ill	581	133	1	2	2,071	448	1,224	134
Calais, Me	1					1	5	5
Cambridge, Md	114	25		4	504	89	312	11
Cape May, N. J	1,446	77		1	357	1,369	3,322	166
Charleston, S. C	754	77		3	689	677	1,325	249
Chincoteague, Va	139					139	358	19
Cincinnati, Ohio	173	34		1	799	139	351	185
Cordova, Alaska	151	56	1	4	903	95	182	1
Corpus Christi, Tex	203	55		1	855	148	226	27
Crisfield, Md	1,082	12			74	1,070	1,984	8
Duluth, Minn	569	66	1	4	1,044	503	820	115
Eastport, Me	49					49	85	21
Edenton, N. C	42					42	114	4
Elizabeth City, N. C	122	2			18	120	468	31
El Paso, Tex	165	12	1	2	319	153	1,519	177
Erie, Pa	403	27	1		448	376	1,920	216
Escanaba, Mich	30	7			72	23	27	5
Eureka, Calif	178	35		3	333	143	399	12
Everett, Wash	210	43		1	532	167	388	16
Fall River, Mass	84	2	1	1	164	82	251	13
Gallipolis, Ohio	134	52	1		648	82	159	1
Galveston, Tex.[2]	1,743	289	5		5,815	1,454	4,261	928
Gary, Ind	33					33	208	22
Georgetown, S. C	100					100	168	16
Gloucester, Mass	564	21	1		212	543	1,628	63

[1] Opened Nov. 16, 1931.

[2] Closed Nov. 15, 1931.

TABLE 2.—*Transactions at United States marine hospitals and other relief stations*—Continued

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1932	Number of days relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
SECOND AND THIRD CLASS STATIONS—continued								
Grand Haven, Mich	107	7			61	100	211	56
Green Bay, Wis	95	21	1		225	74	184	19
Gulfport, Miss	20	2			57	18	27	
Hancock, Mich	71	2			19	69	147	15
Honolulu, Hawaii	1,049	178	2	10	2,462	871	1,923	508
Houston, Tex	1,601	207		3	3,959	1,394	3,663	75
Indiana Harbor, Ind	91					91	150	
Jacksonville, Fla	873	85	2	1	1,074	788	2,332	303
Juneau, Alaska	302	76	1	2	1,070	226	271	32
Ketchikan, Alaska	1,182	219	3	10	2,797	963	2,337	41
La Crosse, Wis	79	14			85	65	101	26
Lee Hall, Va	660					660	984	6
Lewes, Del	204	30	1		288	174	671	19
Los Angeles, Calif	1,329	482	1	18	8,881	847	8,606	372
Ludington, Mich	247	17		1	173	230	729	15
Machias, Me	17					17	45	7
Manila, P. I	1,675	176	2	6	4,657	1,499	2,221	572
Manistee, Mich	103	15		1	115	88	790	13
Manitowoc, Wis	227	33	1		429	194	417	2
Marquette, Mich	301	20			436	281	793	94
Marshfield, Oreg	73	21		1	148	52	108	23
Menominee, Mich	117	3			47	114	249	25
Miami, Fla	668	57	1		608	611	1,283	300
Milwaukee, Wis	919	147	1	2	2,057	772	2,179	521
Morehead City, N. C	431	77	2	3	803	354	1,481	6
Nantucket, Mass	114	4			56	110	219	12
Nashville, Tenn	67	6			81	61	184	71
Natchez, Miss	262	16	1		208	246	754	18
Newark, N. J	26	6			31	20	58	15
New Bedford, Mass	281	22	1		134	259	526	115
New Bern, N. C	316	97	1	3	983	219	432	30
New Haven, Conn	131	16	1		274	115	242	88
New London, Conn	498	43	2	1	499	455	641	85
Newport, Oreg	99	6			65	93	256	8
Newport, R. I	283	30			365	253	453	28
Newport News, Va	291					291	516	37
Ogdensburg, N. Y	119	4			213	115	333	61
Olympia, Wash	33	10		1	153	23	60	2
Oswego, N. Y	143	7			46	136	426	55
Paducah, Ky	294	18	1		118	276	632	25
Panama City, Fla	138	20		1	250	118	280	1
Pensacola, Fla	461	95	3	3	1,067	366	1,213	59
Perth Amboy, N. J	57	2			12	55	107	33
Philadelphia, Pa	5,118	582	9	26	8,473	4,536	27,162	3,165
Ponce, P. R	194	87	1	2	1,127	107	651	25
Port Angles, Wash	230	28		3	143	202	400	80
Port Arthur, Tex	1,368	90			748	1,278	3,133	264
Port Huron, Mich	242	16	1	1	50	226	619	198
Portland, Oreg	1,891	201	4	13	4,293	1,690	4,865	1,731
Providence, R. I	433	41	1	2	516	392	980	282
Provincetown, Mass	138					138	376	15
Reedville, Va	408					408	1,255	18
Richmond, Va	137	26	1		212	111	225	61
Rock Island, Ill	2,329	9			130	2,320	8,254	2,867
St. Thomas, Virgin Islands	74					74	223	8
San Diego, Calif	449	45	2	3	1,605	404	1,361	439
Sandusky, Ohio	51	3			75	48	69	20
San Juan, P. R	800	168	2	6	2,851	632	2,315	160
San Pedro, Calif	3,760	371	2	9	5,117	3,389	10,173	408
Sault Ste. Marie, Mich	1,132	96	2	1	1,049	1,036	1,951	106
Seattle, Wash	5,438	188	7	6	1,646	5,250	18,861	5,096
Seward, Alaska	258	79	1	5	1,535	179	356	1
Sheboygan, Mich	75	6			63	69	144	14
Sitka, Alaska	82	7		1	105	75	154	4
South Bend, Wash	64	22		2	286	42	78	6
Southport, N. C	872	178	1	4	1,972	694	1,035	63
Superior, Wis	286	34	2		394	252	450	18
Tacoma, Wash	341	35		1	687	306	700	88
Tampa, Fla	440	53	2	2	665	387	810	178
Toledo, Ohio	463	71	3		1,036	392	1,242	153
Vicksburg, Miss	237	10	1		25	227	935	32
Washington, D. C	8,069	241	3	9	2,326	7,828	32,356	7,228

TABLE 2.—*Transactions at United States marine hospitals and other relief stations*—Continued

	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1932	Number of days relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
SECOND AND THIRD CLASS STATIONS—continued								
Washington, D. C., dental clinic	1 229					1, 229	16, 703	
Washington, N. C	212	15		1	147	197	388	11
White Stone, Va	608					608	3, 398	26
Wilmington, N. C	552	47		1	372	505	1, 358	151
Wrangell, Alaska	81	19	2		227	62	211	6
FOURTH CLASS STATIONS								
Ashland, Wis	148	17			281	131	279	134
Bath, Me	89	2			13	87	422	8
Bay City, Mich	62	2			18	60	310	
Beaufort, S. C	2					2	2	
Bridgeport, Conn	34	15			152	19	33	1
Hartford, Conn	9	5			109	4	8	
Nome, Alaska	15	1			8	14	34	
Petersburg, Alaska	314	12	2		60	302	1, 062	2
Portsmouth, N. H	9	1			17	8	14	
Saginaw, Mich	11					11	36	
Unalaska, Alaska	2	2			42			
Wilmington, Del	33					33	60	
MISCELLANEOUS								
Curtis Bay, Md. (U. S. Coast Guard)	1, 612					1, 612	15, 571	269
U. S. Coast Guard Academy, New London, Conn	1, 768	54		1	1, 184	1, 714	9, 033	152
St. Elizabeths Hospital, Washington, D. C	163	163	4	153	51, 777			
Special acting assistant surgeons for Coast Guard and Lighthouse Service	4, 961	146	2	2	1, 226	4, 815	17 035	1, 373
U. S. Coast Guard vessels and bases	28, 533					28, 533	105, 832	3, 203
Emergency	53	18			202	35	65	1
Total	105, 060	7, 098	107	365	150, 286	97, 962	365, 999	35, 382
Grand total	266, 875	45, 030	1, 211	4, 858	1, 734, 508	221, 845	972, 110	76, 179

TABLE 3.—*Medical services for various classes of beneficiaries*

Beneficiary	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospital June 30, 1932	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	132, 019	23, 838	648	2, 724	994, 998	108, 181	491, 289	9, 937
Foreign seamen	860	277	8	8	6, 944	583	1, 123	8
Coast Guard	52, 453	3, 756	28	249	91, 655	48, 697	198, 800	11, 481
Bureau of Fisheries	54	12		1	168	42	151	7
Army	384	70	2	2	1, 012	314	986	295
Navy and Marine Corps	235	63	1	4	754	172	653	28
Mississippi River Commission	29	5	1		340	24	24	
Engineer Corps and Army Transport Service	4, 285	1, 090	25	91	35, 797	3, 195	11, 318	77
Lighthouse Service	2, 212	378	15	33	9, 077	1, 834	6, 231	200
Coast and Geodetic Survey	959	155	3	13	3, 260	804	3 899	377
Employees' Compensation Commission	47, 364	2, 614	17	173	63, 623	44, 750	171, 172	20, 002
Veterans' Administration	9, 667	9 214	418	1, 057	348, 531	453	5. 752	1, 092
Immigration Service	2, 816	2, 403	11	112	38, 143	413	19, 094	475
Public Health Service officers and employees	7, 123	703	11	25	9, 415	6, 420	52, 197	1, 436
Lepers	419	418	20	366	130, 387	1	3	
Miscellaneous	5, 996	34	3		404	5, 962	9, 418	30, 764
Total	266, 875	45, 030	1, 211	4, 858	1, 734, 508	221, 845	972, 110	76, 179

TABLE 4.—*Cause of admission and condition on discharge, marine hospitals and other relief stations*

Disease or condition	Number having specified diseases or injury [1]					Condition on discharge of patients for specified diseases or injuries				
	Major condition for which admitted [2]	Condition second in importance	Condition third in importance [3]	Sequelæ to major condition	Total number of persons having each specified disease or injury	Cured	Improved	Not improved	Died	Other conditions
Abnormalities and congenital malformations	56					6	38	1		11
Blood and blood-forming organs, diseases and injuries of	78					4	47	2	13	12
Bones and cartilages, diseases and injuries of	2,151					257	1,165	54	39	636
Circulatory system, diseases and injuries of:										
Heart disease, valvular	241	201	62	5	509	2	139	5	51	44
Varicose veins	247	192	93		532	32	173	2	1	39
All others	1,469					105	882	31	208	243
Communicable and infectious diseases, not including tuberculosis and venereal:										
Conjunctivitis, granular trachomatous	24	3	2		29		18			6
Dengue	1					1	220	1	2	52
Influenza	497	32	11	2	542	222	167	1	4	34
Malaria	256	38	7		301	50	54		2	18
Rheumatic fever, acute	81	15	3	1	100	7	16		10	2
Typhoid fever	50	6			56	22	285	1	10	55
All others	625					274	486	6	3	166
Dental	740	4,894	3,589	14	9,237	79				
Digestive system, diseases and injuries of:										
Appendicitis	1,198	236	89			526	522	1	35	114
Gastritis	324	63	28	1	1,524	64	217		4	39
Hemorrhoids	771	247	124	6	421	228	464	3	1	75
All others	2,183				1,142	333	1,480	18	57	295
Ear, nose, and throat, diseases and injuries of:										
Deviation of nasal septum	436	475	245	1	1,157	112	264	4		56
Otitis media	224	156	60	2	442	35	141	1	2	45
Tonsillitis	2,376	1,131	430	3	3,940	954	1,192	6	10	214
All others	908					228	530	9	7	134
Endocrines, diseases and injuries of	279					8	201	1	9	60
Eye and adnexa, diseases and injuries of	638					102	377	13		146
Genito-urinary system, diseases and injuries of (exclusive of venereal):										
Nephritis	206	128	49	383	766	3	120		53	30
All others	1,729					343	1,080	7	26	273
Hernia	1,791	524	244	3	2,562	688	839	6	14	244
Joints and bursae, diseases and injuries of:										
Arthritis	877	330	249	118	1,574	49	679	11	5	133
All others	405					54	236	7		108
Leprosy	45					1	15		20	9
Lymphatic system, diseases and injuries of:										
Lymphadenitis	305	70	73	159	607	62	186		1	56
All others	34					2	23		1	8
Muscles, fasciae, tendons, and tendon sheaths, diseases and injuries of	1,108					189	638	15	3	263
Nervous system, diseases and injuries of:										
Epilepsy without psychosis	53	13	6		72	22	32	2		19
Neuritis	282	92	23	8	405	37	208	1	2	49
All others	586						347	26	36	140

[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 sequelæ were given, no third diagnosis was recorded.

TABLE 4.—*Cause of admission and condition on discharge, marine hospitals and other relief stations*—Continued

Disease or condition	Number having specified diseases or injury					Condition on discharge of patients for specified diseases of injuries				
	Major condition for which admitted	Condition second in importance	Condition third in importance	Sequelæ to major condition	Total number of persons having each specified disease or injury	Cured	Improved	Not improved	Died	Other conditions
Obstetric and gynecological conditions	59					12	33		1	13
Parasitic diseases:										
Uncinariasis	26	38	15		79	5	17		1	3
All others	186					35	118	1	3	29
Poisonings and intoxications:										
Alcohol (ethyl) poisoning acute	117	17	8		142	42	58		2	15
Alcoholism, chronic (without psychosis)	50	25	9		84	7	32	1	1	9
All others	116					34	52		3	27
Psychiatric diseases:										
Drug addiction without psychosis	67	13	1		81	1	24	3		39
All others	357					20	151	19	9	158
Respiratory system, diseases and injuries of (exclusive of tuberculosis):										
Asthma	225	58	17	2	302	5	179	5	7	29
Bronchitis	579	291	81	2	953	85	379		9	106
Pleurisy	222	111	32	3	368	33	143	5	10	31
Pneumonia	267	50	41	12	370	91	105		56	15
All others	115					7	74	3	9	22
Skin and its appendages, diseases and injuries of	938					224	516	4	9	185
Tuberculosis:										
Tuberculosis, pulmonary	968	137	39	1	1,145	6	255	5	214	488
Tuberculosis (otherwise unclassified)	74	25	16	16	131	8	33	1	15	17
Tumors:										
Carcinoma	262	45	25	1	333	10	75	10	93	74
All others	433					129	190	4	27	83
Venereal diseases:										
Chancroidal infections	323	68	97	217	705	78	185			60
Gonococcus infections	2,774	306	69	27	3,176	405	1,832	4	5	528
Syphilis	2,218	1,016	316	2	3,552	17	1,506	11	57	627
All others	21					4	14			3
Inoculations	4									4
Under observation	577									577
Miscellaneous:										
Cellulitis	268	68	13	6	355	66	144		3	55
All others	3,656					726	1,925	27	38	940
Total	38,176					7,151	21,521	338	1,201	7,965

NOTE.—Immigration patients at United States marine hospital, Ellis Island, N. Y., are not included in this table.

144391—32——11

TABLE 5.—*Number of days in hospital for patients discharged from marine hospitals and other relief stations*

Group	Class of beneficiary															
	Total	American seamen	Foreign seamen	Coast Guard	Army	Navy and Marine Corps	Mississippi River Commission	Seamen Engineer Corps and Army Transport Service	Lighthouse Service	Coast and Geodetic Survey	Employees' Compensation Commission	Veterans' Administration	Immigration Service	Public Health Service officers and employees	Lepers	Miscellaneous
Abnormalities and congential malformations	1,573	756	-------	115	-------	-------	-------	108	-------	-------	379	184	-------	31	-------	-------
Blood and blood-forming organs, diseases and injuries of	4,632	913	-------	308	-------	-------	-------	-------	123	-------	18	3,242	-------	28	-------	-------
Bones and cartilages, diseases and injuries of	103,419	53,017	1,042	4,872	295	86	-------	545	620	241	18,919	23,395	-------	251	-------	136
Circulatory system, diseases and injuries of	107,610	64,658	89	2,307	2	4	-------	3,348	2,664	107	1,020	32,654	109	648	-------	-------
Communicable and infectious diseases, not including tuberculosis and venereal	26,621	15,090	126	2,763	24	20	3,606	1,309	290	117	231	2,181	332	505	-------	27
Dental	16,167	7,699	47	1,202	-------	23	-------	437	107	2	271	6,080	87	89	10	113
Digestive system, diseases and injuries of	116,795	50,753	558	8,939	169	205	17	3,433	1,138	345	232	49,364	253	1,140	-------	249
Ear, nose, and throat, diseases and injuries of	65,479	37,442	114	6,451	28	31	32	1,717	356	172	356	17,786	155	822	-------	71
Endocrines, diseases and injuries of	13,040	5,940	-------	208	-------	-------	-------	339	275	-------	58	6,194	-------	26	-------	-------
Eye and adnexa, diseases and injuries of	16,449	8,768	106	691	-------	6	-------	326	32	15	1,245	5,182	7	71	-------	-------
Genito-urinary system, diseases and injuries of (exclusive of venereal)	62,562	38,139	341	2,431	27	64	18	1,076	410	69	513	18,201	906	355	-------	12
Hernia	49,845	29,119	146	919	-------	-------	-------	1,505	210	73	7,443	10,047	9	374	-------	-------
Joints and bursae, diseases and injuries of	61,328	30,768	282	2,295	-------	-------	-------	439	234	80	3,391	23,604	28	198	-------	9
Leprosy	61,402	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	61,402	-------
Lymphatic system, diseases and injuries of	10,706	7,348	225	518	9	10	-------	217	62	156	273	1,616	232	40	-------	-------
Muscles, fasciae, tendons, and tendon sheaths, diseases and injuries of	23,216	12,667	88	1,711	5	-------	-------	289	220	14	5,266	2,812	10	110	-------	24
Nervous system, diseases and injuries of	67,533	42,859	551	1,190	-------	4	-------	1,288	262	65	1,980	19,066	90	176	-------	2
Obstetric and gynecological conditions	1,060	624	-------	-------	-------	-------	-------	-------	-------	-------	7	138	9	282	-------	-------
Parasitic diseases	6,135	2,776	39	683	-------	-------	-------	145	-------	11	17	2,296	99	69	-------	-------
Poisonings and intoxications	3,800	2,367	15	388	1	9	-------	76	23	-------	437	438	-------	28	-------	18
Psychiatric diseases	27,970	19,158	10	2,503	-------	-------	-------	636	67	33	1,139	4,356	46	22	-------	-------
Respiratory system, diseases and injuries of (exclusive of tuberculosis)	58,569	34,778	108	1,690	92	59	3	981	170	70	269	19,811	245	293	-------	-------

Skin and its appendages, diseases and injuries of	26,327	16,112	81	2,047	47	-------	-------	412	72	81	793	6,257	165	260	-------	-------
Tuberculosis	187,020	153,554	163	7,073	-------	-------	-------	5,328	704	35	800	18,865	186	312	-------	-------
Tumors	28,108	18,338	7	1,038	37	-------	-------	382	141	6	508	7,406	53	152	-------	40
Venereal diseases	248,502	176,360	1,396	22,524	1	64	-------	6,564	1,225	273	639	32,435	6,782	158	-------	81
Inoculations	35	-------	-------	25	-------	-------	-------	-------	-------	-------	-------	-------	-------	10	-------	-------
Under observation	4,143	1,724	22	548	-------	-------	-------	39	10	13	279	975	53	65	412	3
Miscellaneous	84,637	42,655	1,500	5,177	173	178	-------	1,851	322	182	14,457	17,475	109	470	-------	88
Total	1,484,683	874,382	7,056	80,616	910	763	3,676	32,790	9,737	2,160	60,940	332,060	9,965	6,985	61,824	819

NOTE.—Immigration patients at marine hospital, Ellis Island, N. Y., are not included in this table.

TABLE 6.—*Classification of out-patient treatments furnished at United States marine hospitals and other relief stations*

	General medical	Dental	Eye, ear, nose, and throat	Neuro-psychiatric	Tuberculosis	Surgical	Venereal diseases	Inoculations and vaccinations	Arsenicals	Physiotherapy and X ray	Total
Marine hospitals	73,372	194,863	33,472	134	592	109,942	79,446	3,373	15,092	95,825	606,111
Other relief stations	63,746	34,553	16,387	310	338	58,881	20,455	5,671	7,245	26,448	234,034
Special acting assistant surgeons	7,850	490	1,564	70	409	4,688	463	1,301	117	83	17,035
Coast Guard vessels and bases	53,798	18,201	11,262	10	64	18,645	6,097	5,438	303	1,047	114,865
Emergency	65	-------	-------	-------	-------	-------	-------	-------	-------	-------	65
Total	198,831	248,107	62,685	524	1,403	192,156	106,461	15,783	22,757	123,403	972,110

DIVISION OF VENEREAL DISEASES

In Charge of Asst. Surg. Gen. TALIAFERRO CLARK

The activities of the Division of Venereal Diseases during the past year comprised the following: Cooperative statistical studies with five of the larger venereal disease clinics of the country; conduct of the service clinic at Hot Springs, Ark., studies of the prevalence of the venereal diseases in certain areas of the country; cooperation with other divisions of the service; cooperation with the Office of Indian Affairs; completion of certain syphilis control demonstrations; dissemination of educational material, including the publication of Venereal Disease Information; and cooperative work with the States. Most of these activities were started during the previous fiscal year. The majority of them are expected to continue during the coming year.

SCIENTIFIC RESEARCH

The need for intelligent experimental work in this field continues to be urgent. The chronic character of the venereal diseases, their extensive prevalence, and the multitude of handicaps to epidemiological control are important factors which may be greatly aided by research. Unfortunately, experimental investigations in this field progress slowly, because of the insidiousness of these diseases, their manifold manifestations, and illicit sexual relationships, which add to the difficulty of their prompt discovery and application of adequate treatment.

STUDIES AT THE MARINE HOSPITAL, STAPLETON, N. Y.

The work of the Research Laboratory, located at the United States marine hospital, Stapleton, Staten Island, N. Y., has continued as in previous years, without change of personnel, and is directed toward the solution of problems having an intimate bearing on the preventive, or rather public health, aspects of the venereal diseases.

Two preliminary phases of the experimental re-survey of the subject of personal prophylaxis in syphilis have been completed. Reports are now in preparation dealing with (1) the methods which have been developed for the testing of the prophylactic efficiency of various agents in rabbits, and (2) the observations made in experimental work for the determination of the probable period of time required for a virulent strain of the spirochete to penetrate the intact mucosa of rabbits to a point sufficiently deep to escape the influence of superficially applied spirocheticidal agents. Other projected studies will be directed toward the evaluation of the prophylactic efficiency of various chemical and pharmaceutical substances.

Progress has been made during the year also in the study previously reported dealing with the potential dissemination of syphilis through the medium of the symptomless case. Experiments designed to

isolate the spirochete from the seminal fluid of luetics have been completed in 30 selected cases drawn from the latent, seronegative class. A detailed report covering the methods used and the results obtained in this study is being prepared for publication. Further study along this line with the use of material from other classes of luetics, will be pursued as rapidly as possible. These studies are expected to have a marked bearing on the determination of the duration of infectivity of syphilis, which is as yet problematical.

The practicability of utilizing stained preparations, in public health work, rather than the dark-field in the early diagnosis of suspected syphilitic lesions, has been investigated, limited chiefly to some of the more recently described staining techniques. These investigations were undertaken for the purpose of simplifying, if possible, the early diagnosis of syphilis. The superiority of any staining technique over the dark-field has not been indicated by the results obtained.

Investigation of the rôle of the reticulo-endothelial system in combating syphilis, and particularly in the production of the Wassermann substance, was continued and involved search for an ideal suspension of a particulate substance for use in the blockade of the reticulo-endothelial system which does not contain other active constituents that may introduce a factor of error. The importance of the reticulo-endothelial system in combating syphilis is rather emphasized in the newer forms of syphilis treatment, but mainly malaria and artificial fever therapy, which probably depend for their efficacy upon mobilization of the defense forces of the body, a function usually associated with the reticulo-endothelial group of cells.

The effect of ultra-high-frequency radio waves upon the course of animal syphilis and upon the spirochete *in vitro* has also been studied. Some digression was introduced into this investigation in order to study the factors that determine the site and severity of burns following exposure to the high frequency field, in the hope that some method of prevention may be found.

Certain phases of both the morphology and biology of the *Treponema pallidum* still remain indeterminate. Equipment has been assembled for studying the biology of the organism, including a special dark-field apparatus which permits the transillumination of a hanging drop and the introduction of a micromanipulator into the field for the isolation of a single spirochete. This measure will make possible single cell work with the organism and its subsequent implantation into the various artificial culture media, which if successful will materially advance the ultimate control of syphilis. Attempts to grow the spirochete on artificial media have not as yet been uniformly successful, owing, in large measure, it is thought, to the almost practical impossibility of obtaining the organism in pure culture.

Observations have been made also on the so-called transition forms of the spirochete, especially in glandular and other tissue emulsions from infected animals, through the medium of which the disease may be transmitted but in which the spiral form of the spirochete is rarely observed, either by dark-field or in stained-tissue sections.

STUDIES AT CHICAGO, ILL.

The research work was continued on the biologic treatment of gonorrhea. This work has been under way during the past several years 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 assistance of the consultant staffs of the Cook County Hospital and the Illinois Dispensary. Experiments made in an attempt to discover the immunological effect of various fractioned portions of gonococcus toxin are still being carried on. The use of the saline extract of gonococcus toxin was tried with the idea of eliminating certain extraneous and undesirable ingredients which are present in the broth cultures. This step made it necessary for the bacterial growth to be obtained from saline extracts made from solid culture media implanted with the gonococcus, and led to the publication of an important paper on the use of whole human blood agar medium for growing the gonococcus. The use of this medium is believed to be not only important from an experimental standpoint but also of great use in applied bacteriology.

Gonorrhea is one of the longest-known diseases, and it is probably the most ubiquitous disease encountered by the health authorities of the country. In spite of the serious consequences of infection and its very great prevalence, no specific for its cure has yet been found. The success met with in the biologic treatment of other communicable diseases has led to the hope of the development of a biologic product that will be effective, but without success. Research has been carried on, therefore, during the past year, into the nature of toxins in general, in the hope of discovering some essential factor or principle that may be applied to the successful modification of gonotoxin for diagnostic and therapeutic purposes. These studies unfortunately were discontinued at the close of the fiscal year by reason of the limitation of funds.

MALARIA TREATMENT OF NEUROSYPHILIS

Research into the malaria treatment of neurosyphilis, begun last year, was continued during the year in cooperation with the Central State Hospital at Columbia, S. C., and included investigations of the most efficient method of transporting infectious material under varying conditions of temperature, time and distance for use in the induction of malaria for therapeutic purposes.

A strain of the tertian plasmodium has been maintained since the inception of this program two years ago and has been distributed to a number of institutions. This form of malaria is well tolerated by patients and is particularly successful in bringing about remissions in general paralysis of the insane.

The need for a strain of quartan parasites was noted early in these studies, because a relatively large number of individuals, more particularly negroes, are quite refractory to infection with the tertian parasite. These individuals are found to be less refractory to the quartan form. A strain of this relatively uncommon form was secured within the last few months and is carried at the Columbia (S. C.), laboratory. By the close of the year it had been used for the treatment of a number of patients with satisfactory results.

A supply of this material has been furnished other research and treatment centers, notably the Rockefeller Foundation Malaria Research Center, Tallahassee, Fla., and the United States marine hospital at Baltimore, Md., as subsidiary supply stations for emergency use. The incubation period of the quartan plasmodium in the mos-

quito is so long as to make the transmission of infection difficult except by direct blood inoculation. Special studies will be instituted, therefore, in an attempt to solve the question of mosquito transmission of this form of malaria during the coming year.

The availability of *Anopheles* mosquitoes for use in malaria therapy is variable, owing to geographic location and seasonal changes. More recently reasonable assurance of a constant supply of *Anopheles* was made possible with the development of a method of growing this species of mosquito, under suitable conditions, from eggs laid by captured fertilized females. Previously it had been necessary to capture in its natural habitat, each mosquito for use in transmitting malaria. At present only the fertilized females are captured. Eggs deposited by these wild mosquitoes give an abundant supply of adult mosquitoes.

The character and extent of these activities may be summarized as follows:

Paretics inoculated with malaria	99
Paretics known to be infected with malaria (includes 28 at Columbia, S. C.)	33
Inoculations, both positive and negative, made at Columbia	118
Inoculation material used at Columbia for the positive inoculation of 28 individuals consisted of the following:	
Blood containing plasmodium	13
Infected mosquitoes	12
Sporozoites from dissected glands	3
Hospitals and institutions furnished with malaria material during the year	13
Wild mosquitoes collected during year	995
Wild mosquitoes infected with malaria collected	213
Mosquitoes bred from eggs laid by captured mosquitoes	294
Bred mosquitoes infected with malaria	37

Clinical Research

COOPERATIVE CLINICAL STUDIES

Analyses made during the year of the case reports from five of the leading venereal-disease clinics in the United States yielded much information from the therapeutic standpoint. These cooperative studies were carried on with the financial assistance of a large philanthropic foundation. The important statistical compilations were made by this division.

A series of three papers reporting on the results of treatment in early syphilis have been completed and published in Venereal Disease Information.

Some of the more important conclusions based on these retrospective studies on early syphilis are as follows:

The statement can be made, with almost axiomatic force, that continuous treatment, whether prolonged or brief, and practically regardless of the drugs used, is superior in its results to intermittent or other schemes of treatment.

Syphilis of the central nervous system was found to be almost three times as common in those who received little as in those who got much treatment with the arsphenamines, although thorough treatment does not protect necessarily against abnormalities in the spinal fluid.

Six and one-half per cent of the patients who began treatment while their disease was in the early stages attained a cure as evi-

denced by physical examination a year or more after treatment and adequate serologic controls.

Unsatisfactory results were obtained in 26 per cent in spite of treatment. The unsatisfactory results may be classified either as clinical or serological relapse or as failure to reverse a positive serologic test.

In addition to these highly instructive papers on early syphilis, a series of three papers, covering 1,936 cases admitted to treatment with latent syphilis, have been completed and will appear in Venereal Disease Information in the near future. These studies on latent syphilis were based on cases which were clinically nonrecognizable as syphilitic infections.

Two other important studies based on this cooperative clinical material have also been in the process of statistical compilation—one on the treatment reactions of the arsenicals, and the other on the whole field of central nervous system lues. These two projects will probably occupy to a large extent the statistical research time of this division during the coming year. It is expected to carry these studies to their completion, inasmuch as a large part of the cost of the final product has already been expended in the accumulation of these data on a uniform abstract blank.

HOT SPRINGS CLINIC

The Hot Springs clinic, maintained by the Public Health Service in cooperation with the National Park Service for the treatment of indigent persons having venereal diseases, has shown a significant increase in all its activities. During the past fiscal year a total of 6,184 cases of venereal disease were treated, an increase in the combined case rate of 22 per cent over 1931. The cases of syphilis and gonorrhea increased 15 and 30 per cent, respectively. Moreover, 93,707 treatments were given, an increase of 41 per cent, and in addition, 119,464 baths, an increase of 15 per cent as compared with the preceding year. A summary of these activities for the year is given in Table 5.

During the past year the abstracting of 10,000 syphilis records of patients treated at this clinic was started for use in a statistical analysis of the effects of treatment on this class of patients.

Fourteen physicians, including eight junior medical officers of the service, were given postgraduate training.

PREVALENCE STUDIES

An important activity during the past few years has been the attempt to show the trend of the venereal diseases in selected areas of the country and to measure the effectiveness of present-day control methods in this field. The data on the resurvey of 14 communities, including small cities and counties, and one State tentatively reported last year, were further analyzed during the year. It was found in these 14 communities that the trend is slightly downward for both syphilis and gonorrhea—4.4 per cent decrease in the case rate per 1,000 population for syphilis, and 5.5 per cent for gonorrhea. This downward trend, however, is not a consistent one throughout each of the 14 communities resurveyed, but did occur in 9 of them.

Probably the most encouraging development of the study of this material is the appreciable increase in the number of cases of early syphilis and acute gonorrhea that applied for treatment. The number of fresh infections of syphilis under treatment in the public clinics was nearly twice as high as that found in the original survey. There is a growing conviction among public-health officials generally that probably the most important step in the ultimate control of the venereal diseases is the discovery of cases in the early stages of the disease and the prompt application of treatment to render and to keep such cases noninfectious. The increasing number of fresh infections under treatment in these resurveyed communities is therefore of unusual importance and significance from the standpoint of ultimate control.

In comparing the trend of the venereal diseases in these smaller cities and communities with that shown by more or less State-wide surveys, the result is not so optimistic. In Oregon it was found that, during a period of approximately three years, the syphilis case rate had increased 17 per cent, but that the rate of cases in the early stages of the disease is nearly four times the rate for the late cases. The gonorrhea case rate showed a decrease for the chronic cases under treatment and an increase of 11 per cent in the case rate for acute cases. A similarly discouraging situation was met with in a resurvey of upper New York State, published in Venereal Disease Information for November 20, 1931, which showed an apparent increase in the syphilis rate and a slight decrease in the gonorrhea rate as compared with the survey made in 1927.

Three new communities were surveyed during the year, San Francisco, Calif., the city of Birmingham and Jefferson County, Ala., and Dallas, Tex. The data on these surveys is in process of compilation.

Cooperation with Other Divisions of the Service

Division of Marine Hospitals and Relief.—Special case-record forms prepared by this division last year for the purpose of standardizing and securing continuity of antisyphilitic treatment for service beneficiaries found general use in six marine hospitals and the largest outpatient relief station during the year with most satisfactory results. The continued use of these forms is expected to yield greatly needed information regarding the efficacy of various drugs used in antiluetic treatment and the complications of treatment, and it is expected also to stimulate more exact diagnosis and stricter application of indicated therapeutic measures.

The high percentage of the total hospital days in service hospitals charged against the venereal diseases, while due in some measure to the large number of cases admitted for treatment, is in no small degree caused by the length of time required to effect a cure, the tendency to relapse, and the occurrence of serious mental and organic disturbances as late manifestations of syphilis.

In view of the reported benefit derived by the treatment of general paralysis of the insane with malaria and artificial temperatures induced by various physiotherapeutic means, this division has cooperated with the hospital division during the year in the application of these measures to the treatment of service beneficiaries who are in the incipient stages of the disease in an attempt to prevent the occurrence of the serious late manifestations.

Division of Mental Hygiene.—Cooperative activities carried on in Federal penal and correctional institutions last year in cooperation with the Division of Mental Hygiene were continued. Medical officers experienced in venereal disease work have assisted from time to time throughout the year in the organization of more efficient venereal-disease service in these institutions. Educational material has been prepared for distribution and films have been loaned for use in connection with venereal disease lectures before audiences composed of Federal prisoners. It is believed that such measures supplemented by standardized records and treatment methods previously introduced into these institutions will greatly assist in the rehabilitation of prisoners and be most effective in preventing the continued spread of these diseases by them on parole or discharge.

Cooperation with the Office of Indian Affairs, Department of the Interior

The assistance given the Office of Indian Affairs, on request of the commissioner, in the organization of mass control of syphilis among the Indians of the Red Lake Indian Reservation, Minn., has been continued. The various problems attending the provision of treatment facilities, the maintenance of adequate follow-up service, and the study of the prevalence rates among these people have been the principal features of this activity.

During the past year 1,275 reservation Indians were serologically examined, and of these approximately 15 per cent showed a positive Wassermann reaction. A most interesting development of this study is the difference in the serological reaction manifested by this group of Indians which, if found true of other groups throughout the country, would seem to indicate that the reaction of the Indian to treatment, as indicated by serological tests, is markedly different from that of other classes of the general population. The treatment recommended for these cases comprised 5 courses, each course consisting of 6 doses of neoarsphenamine and 12 doses of bismuth, or the equivalent of 30 doses of neoarsphenamine and 60 doses of bismuth. Seventeen per cent of the total number under treatment completed the full five courses, and among these 61 per cent continued to give a positive serological reaction.

Study of Syphilis Among Rural Negroes

The demonstrations inaugurated to show the practicability of mass treatment of syphilis in the rural Negro on an extensive scale in six Southern States in 1929 and 1930 have been completed.

The corrected prevalence rates for syphilis per 1,000 population as ascertained by the Wassermann surveys in these demonstrations are as follows:

Alabama, Macon County	350	North Carolina, Pitt County	118
Georgia, Glynn County	269	Tennessee, Tipton County	259
Mississippi, Bolivar County	236	Virginia, Albemarle County	71

These rates are approximately ten to fifty times higher than the rate 7.2 per 1,000 obtained in 1-day prevalence studies carried out in recent years by the Public Health Service.

The areas involved in these two types of prevalence studies are sufficiently representative of the Negro race to be suitable for comparison. It should be borne in mind, however, that the 1-day census study discloses only those patients who are intelligent enough to seek treatment in the early stages of the disease and to continue treatment for some time after the acute manifestations subside. On the other hand, the mass control survey brings to light practically every type of syphilitic infection, not only such cases as would be reported in a 1-day census study, but also the much larger group of cases of the clinically symptomless latent form of disease.

The expenditures for these demonstrations have been analyzed from the standpoint of the per capita cost of blood tests (case finding); the combined cost of blood tests and treatment on the basis of total population examined during the primary survey; and the total number of syphilitic negroes treated. The per capita cost of case finding, which included the laboratory cost of a blood test and the cost of collecting the blood in the field, averaged $0.54. On the basis of the total number of negroes examined in the case-finding survey, the per capita cost for the entire project was approximately $3.50. The per capita cost of diagnostic and therapeutic blood tests and treatment of all cases of syphilis who started treatment at any time in the course of the demonstration averaged $14.20.

Estimated on an annual basis, the per capita cost of case finding remains unchanged, $0.54; for case finding and treatment combined, $2.30 as compared with $3.50; for diagnostic and therapeutic blood tests and treatment of all cases of syphilis who started treatment at any time, $8.60 as compared with $14.20.

In addition to demonstrating the prevalence of syphilis in the negro in the rural South, these projects indicated the practicability of mass treatment of this population group and furnished valuable information on the needed financial outlay.

Health Education

Distribution of literature on various aspects of the venereal diseases and sex hygiene, the loan of motion-picture films, the presentation of scientific articles and popular lectures, and the publication and distribution of the monthly bulletin Venereal Disease Information were continued during the year.

The value of the publication Venereal Disease Information to the physicians of the country has materially increased, if paid subscriptions may be taken as an indication of its value, which increased from 5,247 in 1931, to 11,008 in 1932, or more than 100 per cent. The total distribution, including paid subscriptions and the free list, increased from 8,158 in 1931, to 13,878 last year, due solely to the increase in paid subscriptions.

A number of important special articles published in Venereal Disease Information during the past fiscal year attracted wide attention, some of which are as follows:

The Kahn Reaction in the Blood Serum of Normal and Syphilitic Guinea Pigs. By K. K. Bryant and J. F. Mahoney. July 20, 1931. 4 pages.

A Practical Belt for Mercury Inunctions. By O. C. Wenger. July 20, 1931. 2 pages.

The Response of the Wassermann Reaction to Treatment in Early Syphilis as Affected by the Factors of Race, Sex, and Pregnancy. By H. M. Robinson and Mildred H. Faupel. August 20, 1931. 5 pages.

Prophylaxis and Treatment of Venereal Disease in the United States. By Audrey G. Morgan. August 20, 1931. 7 pages.

The Control of Gonorrhea. By Taliaferro Clark. September 20, 1931. 9 pages.

Survey of the Venereal Diseases in the City of Baltimore, Baltimore County, and the Four Contiguous Counties. By Taliaferro Clark and Lida J. Usilton. Oct 20, 1931. 20 pages.

A Second Study of the Prevalence of Syphilis and Gonorrhea in Upstate New York. By Albert Pfeiffer and Herbert W. Cummings. November 20, 1931. 18 pages.

The British Treatment Center. By R. A. Vonderlehr. December 20, 1931. 6 pages.

The number of requests for educational material received during the year was 13,112, and 121,126 pamphlets and other publications were distributed to the State boards and departments of health and to private individuals in response to these requests. During the year, 191 reels of The Science of Life film were sent to 29 individuals or schools in 21 States, and wax moulages were lent for use in lectures to lay organizations.

Cooperative Activities with States

At the request of several State departments of health, assistance was extended in the organization of venereal disease control measures within their boundaries. One member of the field staff was engaged during the year in assisting the State health authorities of Tennessee and North Carolina in the development of State-wide venereal disease control programs. Some work was also conducted in the States of Alabama, Georgia, Mississippi, and Virginia.

Forty-three States cooperated with the service in reporting the prevalence of venereal diseases and the measures employed for their control. During the fiscal year there were 2,458,932 laboratory examinations made in these States, an increase of 15 per cent over 1931. Of this number, 2,051,636 were serologic tests for the diagnosis of syphilis, 8,163 dark-field examinations, and 399,133 examinations for the gonococcus. A total of 1,206,321 doses of the arsphenamines were distributed, an increase of 15 per cent. These States also reported 422,191 cases of venereal diseases, representing 260,564 cases of syphilis, 158,083 cases of gonorrhea and 3,544 cases of chancroid. The increase for all venereal diseases was 8.4 per cent, for syphilis and gonorrhea, increases of 13.4 and 1.4 per cent, respectively, and a decrease of 1.1 per cent for chancroid. The State activities are shown in Table 1.

Clinic Activities

In 1932 there were 533 clinics reporting, as compared with 512 in 1931. The number of new cases admitted to these clinics was 148,933, an increase of 3.4 per cent over the previous year. Detailed data for clinic activities are shown in Table 3.

TABLE 1.—*Report of State departments of health, showing the number of cases of syphilis and gonorrhea reported, the annual rates per 1,000 inhabitants, the amount of arsphenamine distributed, and the laboratory examinations made from July 1, 1931, to June 30, 1932*

State	Number of cases		Annual rate for syphilis and gonorrhea per 1,000 inhabitants [1]	Doses of arsphenamines distributed	Laboratory examinations		
	Syphilis	Gonorrhea			Wassermann (or other similar) tests	Microscopic examinations for treponema pallidum	Microscopic examinations for gonococcus
Total	260,564	158,083	3.6	1,206,321	2,051,636	8,163	399,133
Alabama	13,204	5,451	7.0	79,878	105,633	355	3,906
Arizona	263	209	1.1				
Arkansas	4,720	2,864	4.1	18,870	40,755	695	11,226
California	15,740	12,370	5.0	150,472	71,517	489	15,560
Colorado	889	380	1.2	7,849	11,114	5	2,693
Connecticut	1,515	1,341	1.8	12,409	31,644	28	3,801
Delaware	1,391	440	7.7	4,064	4,364		939
District of Columbia	1,532	1,097	5.4	9,049	5,671	31	3,174
Florida [2]	2,094	398	3.4	2,986	1,270		289
Georgia	11,714	4,232	5.5	66,378	69,704	15	2,973
Idaho	5	4			803		434
Illinois	18,094	17,505	4.7	123,825	91,633	1,432	48,514
Indiana	2,820	1,837	1.4	39,087	101,132	2	6,482
Iowa [3]	570	457	.5	6,470	2,030	34	2,995
Kansas	941	718	.9	9,777	45,218	4	4,537
Kentucky	3,784	4,646	3.2	26,014	11,014	371	4,051
Louisiana	2,790	1,110	1.9	10,482	15,214	95	2,408
Maine	497	900	1.8	3,617	7,336		3,964
Maryland	3,108	2,264	3.3	40,995	9,975	144	5,904
Massachusetts	4,682	6,929	2.7	75,225	100,478		7,685
Michigan	12,957	7,500	4.2	24,915	43,164		39,716
Minnesota	4,142	3,872	3.1	7,843	108,317	2	12,150
Mississippi	11,395	17,823	14.5	11,549	36,934		1,477
Missouri	4,100	2,468	1.8	34,605	24,124	1,483	15,499
Montana [4]							
Nebraska	1,027	1,642	1.9	8,310	24,196	81	4,874
Nevada					2,528	3	899
New Hampshire	99	159	.6	1,995	5,102		1,814
New Jersey	7,571	4,088	2.9	43,173	37,209	77	5,719
New Mexico [4]							
New York	63,590	18,661	6.5	99,355	729,195	911	87,343
North Carolina [4]							
North Dakota	384	919	1.9	244	5,788	13	2,835
Ohio	8,057	4,494	1.9	64,133	44,711	1,293	15,697
Oklahoma [4]							
Oregon	588	1,007	1.7	3,426	11,409	21	4,366
Pennsylvania	3,973	3,788	.8	39,371	61,010		14,464
Rhode Island	974	830	2.6	11,801	15,070	59	5,622
South Carolina	5,401	7,404	7.4	3,657	697		1,591
South Dakota	321	560	1.3		6,609		
Tennessee	8,416	3,924	4.7	56,620	43,517	219	7,552
Texas	4,921	1,259	1.1	32,942	7,707	21	3,107
Utah [4]							
Vermont [5]	286	405	2.3	1,377	4,263	8	1,734
Virginia	6,250	1,412	3.2	21,283	48,599	16	5,541
Washington	2,129	2,536	3.0	8,339	44,845	180	23,266
West Virginia	23,047	6,385	17.0	34,975	9,491	26	2,459
Wisconsin	583	1,795	.8	8,961	10,646	50	9,873
Wyoming [4]							

[1] Excludes chancroid, which formerly was included in the annual rates.
[2] For 6 months.
[3] For 11 months.
[4] Not reporting.
[5] For 10 months.

TABLE 2.—*Report of 63 correctional and penal institutions*

	Number
New cases admitted:	
Syphilis	7, 916
Gonorrhea	4, 072
Chancroid	235
Total	12, 223
Cases discharged as arrested or cured	6, 488
Treatments given	369, 100
Doses of arsphenamines administered	44, 590
Wassermann tests made	50, 047
Microscopic examinations for gonococcus	11, 290

TABLE 3.—*Report of 533 clinics furnished through State health departments, July 1, 1931, to June 30, 1932* [1]

State	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	Gonorrhea	Chancroid					
Total	5, 986	148, 933	89, 769	57, 058	2, 131	63, 906	[2] 2,954, 130	742, 963	515, 884	196, 783
Alabama	188	15, 245	11, 233	3, 837	175	7, 192	224, 500	84, 148	22, 387	3, 899
Arkansas	60	7, 479	4, 658	2, 819	2	7, 387	[3] 229, 761	18, 497	39, 704	1, 052
California	318	8, 959	5, 408	3, 547	4	2, 414	189, 088	53, 390	32, 576	12, 264
Colorado	48	965	658	298	9	576	31, 461	7, 849	2, 570	1, 086
Connecticut	93	1, 590	802	764	24	926	40, 183	9, 506	2, 025	1, 368
Delaware	12	217	129	81	7	143	2, 813	966	218	9
District of Columbia	12	2, 647	1, 532	1, 097	18	25	30, 498	9, 049	5, 671	3, 184
Florida [4]	9	696	535	135	26	151	7, 616	2, 986	1, 269	289
Georgia	71	3, 602	2, 376	1, 192	34	1, 490	55, 916	26, 123	22, 716	1, 058
Illinois	285	13, 465	7, 047	6, 319	99	8, 376	278, 525	15, 821	73, 568	37, 314
Indiana	183	3, 569	1, 975	1, 519	75	1, 843	112, 103	37, 221	10, 145	3, 836
Iowa [4]	85	1, 041	575	464	2	505	27, 474	6, 506	2, 051	3, 013
Kansas	35	746	466	264	16	202	18, 040	5, 790	2, 234	1, 046
Kentucky	303	8, 385	3, 631	4, 583	171	1, 948	85, 140	25, 140	10, 549	3, 846
Louisiana	16	655	474	177	4	40	5, 306	2, 812	947	373
Maine	96	681	287	393	1	239	11, 747	3, 443	1, 308	501
Maryland	263	5, 445	3, 037	2, 190	218	1, 678	127, 379	40, 447	9, 584	5, 415
Massachusetts	300	5, 658	2, 731	2, 927		1, 140				
Michigan	162	6, 860	3, 378	3, 402	80	3, 390	194, 810	24, 848	41, 253	39, 705
Minnesota	48	908	406	499	3	381	28, 510	5, 429	2, 820	1, 248
Missouri	118	3, 013	1, 936	1, 065	12	697	73, 131	15, 652	10, 361	3, 225
Nebraska	36	1, 167	583	574	10	237	29, 833	7, 556	5, 361	2, 601
New Hampshire	47	151	64	87		73	8, 621	2, 056	587	425
New Jersey	296	6, 909	4, 430	2, 387	92	2, 160	200, 889	42, 226	22, 737	4, 945
New York	665	9, 257	6, 772	2, 474	11	6, 639	213, 049	59, 982	26, 028	11, 034
North Dakota	10	52	13	39		26	890	267	53	195
Ohio	477	12, 023	7, 304	4, 221	523	3, 691	237, 005	62, 245	40, 446	14, 001
Oregon	12	524	358	166		44	13, 064	3, 426	1, 223	981
Pennsylvania	742	7, 210	3, 753	3, 348	109	3, 892	69, 551	37, 559	12, 740	
Rhode Island	72	907	507	397	3	558	27, 338	6, 581	13, 155	5, 622
Tennessee	457	8, 527	6, 051	2, 197	279	2, 912	189, 196	55, 182	43, 143	7, 545
Virginia	87	3, 949	2, 857	1, 017	75	513	52, 377	25, 468	12, 988	2, 881
Washington	36	1, 457	802	648	7	986	34, 441	8, 339	23, 359	10, 539
West Virginia	208	3, 361	2, 084	1, 236	41	928	58, 381	27, 592	9, 462	2, 410
Wisconsin	135	1, 613	917	695	1	504	45, 494	8, 861	10, 646	9, 873

[1] States which did not report and those which had no clinics have been omitted from this table; they are Arizona, Idaho, Mississippi, Montana, Nevada, New Mexico, North Carolina, Oklahoma, South Carolina, South Dakota, Texas, Utah, Vermont, and Wyoming.

[2] Includes 119,464 baths given at the National Park Clinic, Hot Springs, Ark.

[3] For 6 months.

[4] For 11 months.

TABLE 4.—*Report of cooperative clinic activities furnished through State health departments from 1919 to 1932*

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	383	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	55,563	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
1932	533	148,933	2,954,130	63,906	19.84

TABLE 5.—*Report of the United States Public Health Service clinic at Hot Springs National Park, Ark., from July 1, 1931, to June 30, 1932* [1]

Total applicants	5,106
Venereal	[2] 4,287
Nonvenereal	819
Syphilis	3,188
New cases	2,435
Readmitted cases	753
Gonorrhea	2,996
New cases	2,467
Readmitted cases	529
Syphilis (new cases)	2,435
Primary	205
Secondary	197
Tertiary	1,869
Neuro	153
Congenital	11
Gonorrhea (new cases)	2,467
Acute	181
Chronic	2,286
Treatments given	213,171
Arsphenamine	12,350
Mercury and bismuth	27,677
Other intravenous	860
Gonorrhea	52,820
Baths	119,464
Laboratory examinations	69,959
Complement fixation tests	21,016
Precipitation tests	10,169
Gonococcus smears	10,204
Darkfields	664
Icterus indices	9,171
Urine analyses	18,735

[1] From the annual report of the clinic.
[2] The 4,287 patients represent 6,184 cases; 1,899 patients had both syphilis and gonorrhea.

TABLE 6.—*Report of the United States Public Health Service clinic at Hot Springs National Park, Ark., from July 1, 1922, to June 30, 1932*

Year	Number of applicants	Number of cases			Treatments given [1]	Wassermann tests made
		Total venereal diseases	Syphilis	Gonorrhea		
Total	47,946	39,176	24,526	14,650	686,877	76,710
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
1932	5,106	6,184	3,188	2,996	93,707	10,847

[1] Baths not included.

TABLE 7.—*Statistical summary of activities in the control of venereal diseases for the fiscal years 1931 and 1932*

	1932	1931 [1]
MEDICAL ACTIVITIES		
A. Cases of venereal diseases reported to State health departments:		
I. Syphilis	260,564	229,720
II. Gonorrhea	158,083	155,895
III. Chancroid	3,544	4,002
Total	422,191	389,617
B. Doses of arsphenamines distributed by State health departments	1,206,321	1,055,181
C. Clinics:		
I. Clinics established during the year	47	55
II. Clinics reporting to State health departments	533	512
III. Report from clinics—		
a. New cases admitted	148,933	143,982
b. Cases discharged as arrested or cured	63,906	57,655
c. Treatments given	2,954,130	2,847,024
d. Doses of arsphenamines administered	742,963	789,155
e. Wassermann tests made	515,884	487,823
f. Microscopic examinations for gonococcus	196,783	204,624
D. Requests for medical information received by the Public Health Service	344	214
EDUCATIONAL ACTIVITIES		
A. Pamphlets:		
I. Requests for pamphlets received by the Public Health Service	13,112	17,292
II. Pamphlets distributed—		
a. By the Public Health Service to—		
1. State health departments	2,817	8,176
2. Others	118,309	149,157
Total	121,126	157,333
b. By State health departments	697,252	718,771
c. Gross total pamphlets distributed	818,378	876,104
Minus pamphlets distributed by the Public Health Service to State health departments	2,817	8,176
d. Net total pamphlets distributed	815,561	867,928
III. Venereal disease pamphlets issued by the Public Health Service	8	10
B. Lectures, exhibits, and film showings:		
I. Lectures, exhibits, and film showings reported by the—		
a. Public Health Service	6	215
b. State health departments	2,726	2,771
Total	2,732	2,986
II. Average attendance reported by the—		
a. Public Health Service	85	87
b. State health departments	83	85
Total	83	85
III. Motion picture films and exhibits loaned by the Public Health Service	191	227

[1] Data for 1931 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, 1932, marks the second full 12 months' activities of the Division of Mental Hygiene in the Office of the Surgeon General. The administrative and investigative functions of the division continued unchanged during the year. They embrace 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 of 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, lastly, 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 persons apprehended for violation of the narcotic laws. Such information is proving of value in determining the potential needs respecting the treatment of persons addicted to the use of habit-forming drugs. It has furnished important epidemiological data upon this subject. Studies of the nature of drug addiction with reference to the mental and psychiatric status of those addicted to the use of drugs have been continued among drug-addict Federal prisoners at the United States Penitentiary Annex, Fort Leavenworth, Kans. Biochemical studies were also continued with special reference to water and lipoid metabolism in connection with drug addiction.

In addition to the special studies being carried on at Fort Leavenworth, Kans., the personnel of the Public Health Service detailed there supervises and furnishes the medical and psychiatric services for the prison population.

DISSEMINATION OF INFORMATION

Studies conducted in an effort to evaluate the past experiences of States and local jurisdictions pertaining to their attempts at solving the medico-social problem of drug addiction have been continued

during the current fiscal year. A summary of the Laws Relating to Narcotic Drugs, Adopted During 1931, With Citations, was completed during the fiscal year.

Further data dealing with the epidemiological factors of drug addiction in the United States have been assembled. This material has served as a basis for a publication, Drug Addiction and Measures for Its Prevention in the United States.[1] Arrangements were made for the publication of The Chemistry of the Opium Alkaloids, by Dr. Lyndon F. Small, consultant in alkaloid chemistry, and the material was in press at the close of the year.[2] It is 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.

Other articles have appeared, prepared by officers of the service, dealing with the administrative problems of concern to the division, including Administrative Problems of Sick Call in Penal Institutions,[3] by Acting Asst. Surg. Charles A. Bennett; Complete Routine Physical Examination of Prisoners,[4] by Surg. Marion R. King; A Rapid Determination of Mental Age,[5] by Surg. J. G. Wilson; and Medical and Psychiatric Services in Federal Penal and Correctional Institutions,[6] by Asst. Surg. Gen. Walter L. Treadway.

Studies of the Abusive Use and the Medical and Scientific Needs of Narcotic Drugs

Mr. Barkev Sanders was employed on February 8, 1932, to undertake special studies, with the aid of three statistical clerks, of the legal distribution of narcotic drugs to the retailer and dispenser. This is the first time that an analysis of the legal distribution to that group has been undertaken, and is for the purpose of determining the medicinal and scientific needs of the country concerning these drugs. This work is being carried on in cooperation with the Bureau of Narcotics of the Treasury Department. The desirability of undertaking the analysis of hospital uses of these drugs, of the prescriptions on file in pharmacies, and of the record of dispensing physicians and others as a means for ultimately determining the medicinal and scientific needs of the country, has been given consideration, but no field studies have been inaugurated along these particular lines, the service having confined itself to the official records of the movement of these drugs in legal channels.

Administration of Narcotic Farms

Plans for the development of the first United States narcotic farm at Lexington, Ky., have progressed sufficiently to let the contract for the construction of the necessary buildings. Construction began at Lexington in January, 1932. During the year an appropriation was made for the purchase of the site selected for the second narcotic farm in the vicinity of Fort Worth, Tex., and measures were instituted by the Treasury Department for acquisition of the ground.

---

[1] J. A. M. A., vol. 99, No. 5, July 30, 1932.
[2] Supplement No. 103 to Public Health Reports.
[3] Pub. Health Rep., vol. 47, No. 27, July 1, 1932.
[4] Ibid., No. 22, May 27, 1932.
[5] Proceedings, 61st Annual Congress American Prison Association, p. 163.
[6] Am. J. Psychiatry, Vol. XII, No. 1, July, 1932.

Medical and Psychiatric Services in Federal Penal and Correctional Institutions

The fiscal year marks the second year of the work of the Public Health Service in supervising and furnishing the medical and psychiatric services for Federal penal and correctional institutions. The policies previously inaugurated and adopted have been continued. Surg. J. G. Wilson continued as chief medical officer at the United States Penitentiary, Atlanta, Ga., where additional equipment has been installed, a new unit to the hospital completed, and the work rendered more stable and uniform; Acting Asst. Surg. Edda von Bose continued as chief medical officer at the Federal Industrial Institution for Women, Alderson, W. Va.; Acting Asst. Surg. Charles A. Bennett continued as acting chief medical officer at the United States Penitentiary, Leavenworth, Kans.; Passed Asst. Surg. A. J. Aselmeyer continued as chief medical officer at the United States Industrial Reformatory, Chillicothe, Ohio; Acting Asst. Surg. Carl I. Pirkle continued as chief medical officer at the Federal Reformatory Camp, Petersburg, Va., where the facilities were enlarged and much needed equipment was provided; and Surg. Marion R. King continued as chief medical officer at the United States Penitentiary Annex, Fort Leavenworth, Kans., where special studies and investigations of the nature of drug addiction are being carried on by the service.

During the course of the year the medical services at the United States Penitentiary, McNeil Island, Wash., were assumed by the service, effective July 15, 1932. Surg. Justin K. Fuller was assigned as chief medical officer. Many improvements have been made during the year, new hospital equipment being provided and the hospital facilities being enlarged and improved.

The medical services at the Federal Correctional Camp, Fort Eustis, Va., were assumed by the service on January 1, 1932; and at the Federal Jail, New Orleans, La., and the Federal Detention Farm, La Tuna, Tex., on March 1, 1932. Requests were also received to supervise and furnish the medical services at the Hospital for Defective Delinquents, Springfield, Mo., and the Federal Detention Headquarters, New York City. Action upon these requests was postponed until the next fiscal year.

Studies and Investigations of the Causes, Prevalence, and Means for the Prevention and Treatment of Nervous and Mental Diseases

Owing to the dearth of funds and personnel, it has not been possible to inaugurate any special field studies in connection with the causes, prevalence, and means for the prevention and treatment of nervous and mental diseases. Studies incident to the diagnosis and routine care of mentally disordered persons in Federal prisons have been continued, and a special study inaugurated with reference to the psychiatric phases incident to disciplinary and other problems of penal and correctional procedure.

DIVISION OF PERSONNEL AND ACCOUNTS

In charge of Asst. Surg. Gen. C. C. PIERCE

The operations relating to personnel, finances, and property records were conducted as in previous years through the Division of Personnel and Accounts. 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.

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, 1932. In the appendix will be found a financial statement showing expenditures from appropriations of the Public Health Service for the fiscal year 1932.

PUBLIC HEALTH DISTRICTS

Public health district No. 1.—The headquarters of this district are located in the Subtreasury Building, Wall, Nassau, and Pine Streets, New York City. Medical Director Wm. S. Terriberry was detailed as district director on December 1, 1931, succeeding Medical Director E. K. Sprague, who had been placed on waiting orders. The district comprises the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey, and the Canadian border from Halifax to Buffalo.

The large number of stations of the Public Health Service in this district include seven marine hospitals, three of which are located in the metropolitan area of New York. The district director states that the service at these hospitals remains at the same high level as in previous years.

All the quarantine stations in the district are operating smoothly, efficiently, and economically. The floating equipment of the stations at Rosebank, Staten Island, New York, and Gallops Island, Boston Harbor, Mass., was increased and greatly improved during the year.

While the immigration into the district from foreign countries decreased somewhat during the year, the stations at Ellis Island and Boston remained very active, owing to the large amount of work connected with warrant cases and deportees.

An extensive medical service for personnel of the Coast Guard was maintained, and contact with the Coast Guard in the district was close.

Many conferences were held. One of the most important was the conference with the Department of Health of the City of New York on the subject of the infantile paralysis epidemic.

Although direct contact with the State health officers in the district was not extensive, the relation between them and the district headquarters remained cordial and cooperative.

Public health district No. 2.—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, North Carolina, South Carolina, Georgia, Kentucky, and Tennessee, and the District of Columbia.

The service activities in the district are carried on at 90 stations, including 6 marine hospitals. Inspections were made of practically all of these stations during the year, most of the important stations having been visited twice. Building operations were in progress at the marine hospitals at Baltimore, Md., Norfolk, Va., Louisville, Ky., and Memphis, Tenn.

The director reports that there has been a noticeable improvement in the administration of stations in the district and in the care rendered beneficiaries.

Several special investigations were made of service operations. At the request of the Commissioner of Indian Affairs, a special inspection was made of the Cherokee (N. C.) Indian Reservation and School.

A large number of conferences were held during the year with service officers, State and local health authorities, immigration officials, and officials of the United States Veterans' Administration.

Public health district No. 3.—Medical Director A. J. McLaughlin continued as director throughout the year. The headquarters of this district are maintained at 536 Lake Shore Drive, Chicago, Ill. The district is composed of the States of Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, and South Dakota.

Five marine hospitals and twenty-six third-class relief stations are located in this district. The director maintained close contact with all stations, inspecting as many as time permitted.

Medical and surgical relief to personnel of the Coast Guard was furnished at a number of the marine hospitals and relief stations in the district in addition to that furnished by 32 part-time physicians employed for the specific purpose of rendering such service.

Several special investigations were made by the district director and full reports rendered thereon.

Many informal conferences were held with service officers and with State and local health officials.

Much of the time of the director was spent in liaison work with the States. Such work ranged from private consultations and advice to health officers to formal surveys. Complete public health surveys were made of the State of Kansas and the City of Duluth.

Public health district No. 4.—Medical Director L. L. Lumsden served as director throughout the year, his headquarters being located in Room 305, Customhouse, New Orleans, La. This district includes the States of Florida, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, and Texas.

In this district the service operates 5 hospitals, 2 second-class relief stations, 14 third-class relief stations, and 31 quarantine stations. Most of the time of the district director during the past year was spent in inspecting and keeping in contact with the various stations of the service. He reports that the activities at all stations were conducted efficiently.

In addition to his general duties in the seven States of the district, the director, under special orders, supervised studies of rural sanitation in the States of Kentucky, Tennessee, and South Carolina.

Investigations were made of a localized outbreak of Rocky Mountain spotted fever, eastern type, in Louisiana, and of localized outbreaks of influenza-pneumonia in Louisiana and Texas.

Surveys were made of public health administration in Mississippi and Alabama.

A large number of conferences regarding public health matters were held with service officers on duty in or visiting the district, with the State health officers of all the States mentioned above, and with a large majority of the whole-time county or parish health officers in these 10 States.

Addresses were delivered by the director before 12 meetings of organizations held in the interest of public health.

Two new relief stations were established in the district within the year—one at the Federal jail in New Orleans, La., and the other at the Federal Detention Farm at La Tuna, Tex.

Especially noteworthy among constructive developments in the district within the year were the completion and occupancy of the new marine hospital and the new quarantine station at New Orleans, La., and the new marine hospital at Galveston, Tex. There was also considerable structural improvement made at the marine hospital at Key West, Fla.

Public health district No. 5.—Medical Director J. C. Perry continued to serve as director, with headquarters at 76 New Montgomery Street, San Francisco, Calif. The fifth district includes the States of California, Nevada, Arizona, New Mexico, Utah, and Colorado.

The work of the service in this district is performed at 2 large marine hospitals, 3 second-class relief stations, 4 third-class relief stations, 6 quarantine stations, and 12 immigration stations. All of these stations were inspected during the past year, and the larger stations, with the exception of the marine hospital at Fort Stanton, were visited twice. The director reports that all stations functioned satisfactorily throughout the year. Close contact was maintained with stations in California, either by personal conference or by correspondence with officers on points upon which advice was desired.

A new marine hospital was opened in San Francisco within the year, resulting in an increase in the number of beneficiaries under medical and surgical care in that city. Certain structural improvements were effected at the United States marine Hospital at Fort Stanton, N. Mex.

Liaison work with States was carried on during the year. For the sixth consecutive year personnel of the Alaskan canneries were examined and vaccinated in conformity with a request of the commissioner of health of Alaska.

The director maintained close cooperation with the health officers of San Francisco and Los Angeles, and also with the director of the California State Department of Public Health.

Addresses on public-health subjects were delivered by the district director before various organizations in California.

The director also remained in charge of plague-suppressive measures in California, holding numerous conferences in connection with that work.

Public health district No. 6.—The headquarters of this district are located at 216 Canadian National Pier, Seattle, Wash. Medical Director L. D. Fricks continued as district director throughout the year. The district comprises the States of Washington, Oregon, Idaho, Montana, and Wyoming, and the Territory of Alaska.

The activities of the service within this district are conducted at 1 first-class station, the Port Townsend Marine Hospital; 22 second, third, and fourth class relief stations; 12 quarantine stations; 23 immigration stations; 5 United States Coast Guard relief stations; 7 aircraft quarantine stations; and the Rocky Mountain spotted fever laboratory at Hamilton, Mont. Inspections were made by the director during the year of all stations in the district with the exception of those in Alaska and four small stations in the States.

The director kept in close contact, by correspondence and by personal visits when feasible, with the State health officers of Washington, Oregon, and Montana, the commissioner of health of Alaska, and the city health officers of Portland, Oreg., and Seattle, Wash.

On February 9, 1932, the corner stone of the new Seattle Marine Hospital was laid with appropriate ceremonies in the presence of a group of local physicians, shipping people, and others interested in the erection of the hospital.

In addition to his duties as district director, the director serves as chief quarantine officer on Puget Sound and as medical officer in charge of the Seattle relief station. These latter duties consume approximately two-thirds of his time; and because of the fact that no experienced junior officer is attached to his station, he has frequently found it impossible to give as much time to the inspection of outlying stations as the importance of that work warrants.

Personnel

COMMISSIONED OFFICERS

On July 1, 1931, 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 surgeon; 53 assistant surgeons, 11 assistant dental surgeons, 4 assistant sanitary engineers, and 10 assistant pharmacists, all in the grade of assistant surgeon. Of this number, aggregating 349, 2 medical directors, 14 senior surgeons, 8 surgeons, and 2 passed assistant surgeons were on waiting orders. During the fiscal year the following changes occurred in the several grades: 1 assistant surgeon general reverted to the rank of senior surgeon;

1 surgeon was detailed as an Assistant Surgeon General; under section 7 of the act dated April 9, 1930, 1 physician was appointed and commissioned to the grade of surgeon; 6 candidates for appointment as assistant surgeon and 9 candidates as assistant dental surgeons, in 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; 2 senior surgeons were promoted to the grade of medical director, 2 surgeons were promoted to the grade of senior surgeon, 1 passed assistant surgeon to the grade of surgeon, 5 assistant surgeons to the grade of passed assistant surgeon, and 2 assistant dental surgeons to the grade of passed assistant dental surgeon; 1 sanitary engineer, 1 passed assistant dental surgeon, and 2 assistant surgeons resigned; 2 medical directors, 1 senior surgeon, and 1 assistant surgeon were placed on waiting orders because of physical disability; 1 medical director on active duty and 3 senior surgeons on waiting orders died.

On July 1, 1932, after these changes had occurred, the regular corps consisted of the Surgeon General, 8 Assistant Surgeons General, 42 medical directors, 1 pharmacologist director in the grade of medical director, 29 senior surgeons, 1 senior dental surgeon, 1 senior sanitary engineer in the grade of senior surgeon; 88 surgeons, 13 dental surgeons, and 11 sanitary engineers in the grade of surgeon; 66 passed assistant surgeons, 7 passed assistant dental surgeons, and 5 passed assistant sanitary engineers in the grade of passed assistant surgeon; 52 assistant surgeons, 18 assistant dental surgeons, 4 assistant sanitary engineers, and 10 assistant pharmacists, all in the grade of assistant surgeon—a total of 357 officers. Of this number, 4 medical directors, 12 senior surgeons, 8 surgeons, 2 passed assistant surgeons, and 1 assistant surgeon were on waiting orders.

At the close of the fiscal year 1932, 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; 6 medical directors were on duty as directors of the public health districts; 1 surgeon (as chief surgeon) and 2 passed assistant surgeons were serving on detail to the Bureau of Mines, Department of Commerce; and 1 surgeon, 1 passed assistant surgeon, and 1 assistant surgeon were serving (the surgeon as medical director) on detail to the United States Employees' Compensation Commission. Two medical directors were assigned as assistants to the director, Pan American Sanitary Bureau, Washington, D. C.; 1 medical director, 1 senior surgeon, 5 surgeons, 2 passed assistant surgeons, and 1 assistant pharmacist 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 dental surgeon, 2 passed assistant surgeons, 1 passed assistant dental surgeon, 2 assistant surgeons, and 2 assistant dental surgeons were serving on detail with the United States Coast Guard Service; 3 surgeons, 3 passed assistant surgeons, 1 passed assistant dental surgeon, and 3 assistant surgeons were assigned for duty at various penal and correctional institutions.

RESERVE OFFICERS

On July 1, 1931, the reserve commissioned officers on active duty numbered 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.

On July 1, 1932, the number of reserve officers on active duty was 29, consisting of 6 surgeons, 1 dental surgeon, 11 passed assistant surgeons, 1 passed assistant dental surgeon, 5 assistant surgeons, and 5 assistant dental surgeons.

ACTING ASSISTANT SURGEONS

On July 1, 1931, there were 717 acting assistant surgeons in the Public Health Service, and by July 1, 1932, this number had increased to 732.

Of the 732 acting assistant surgeons, 124 were on duty at marine hospitals; 409 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; 110 were on detail with the United States Coast Guard; 5 were serving with the Bureau of Mines by detail; 24 were serving at various penal and correctional institutions; 1 was on part-time duty at Marine City, Mich., to examine applicants for marine service; and 46 were engaged in antivenereal-disease activities as part-time employees at nominal compensation. Fourteen of the forty-six acting assistant surgeons engaged in antivenereal-disease activities held appointments as collaborating epidemiologists.

ATTENDING SPECIALISTS

On July 1, 1931, there were 370 attending specialists in the service, and during the year this number increased to 426, of which number 232 were consultants to marine hospitals, while 53 were available for call at second and third class relief stations; 9 were engaged in antivenereal-disease activities; 27 were serving at various penal and correctional institutions; 105 were consultants in connection with quarantine, immigration, and scientific research activities.

INTERNES

On July 1, 1931, there were 98 internes in the service; on July 1, 1932, there were 99, of whom 31 were dental and 6 students. Internes are appointed for temporary periods of one year for duty at marine hospitals.

PHARMACISTS AND ADMINISTRATIVE ASSISTANTS

On July 1, 1931, there were 19 pharmacists and 27 administrative assistants in the Public Health Service. During the year 1 chief pharmacist died; 1 administrative assistant (first class) was transferred to the departmental service and an addition of 5 was made in the administrative assistant corps, making a total at the end of the fiscal year of 49, as follows: 14 chief pharmacists, 4 pharmacists, 11

administrative assistants (first class), 4 administrative assistants (second class), 10 administrative assistants (third class), 6 administrative assistants (fourth class).

NURSES, DIETITIANS, AND RECONSTRUCTION AIDES

The work of the nursing section proceeded with 1 superintendent of nurses, 1 assistant superintendent of nurses, and 1 clerk for all work connected with the maintenance of a personnel of something over 600, including nurses, dietitians, aides, librarians, and, recently, guard-attendants and male nurses in Federal prison camps.

Additional duties have been added in the furnishing of nursing service to the medical service in Federal prisons under the Division of Mental Hygiene and the establishment of prison camps at various points throughout the country for short-term offenders. In these camps nurses or guard-attendants have been assigned.

Guard-attendant is the name given to a new type of employee who combines the function of guard and nurse-attendant and who will be assigned to duty in prison camps on narcotic farms and in the 600-bed hospital for defective delinquents now under construction at Springfield, Mo.

During the year three new hospitals were opened, necessitating an increase in nursing personnel at Galveston, Tex.; New Orleans, La.; San Francisco, Calif.; and the Federal prison at McNeil Island, Wash. In the coming year it is expected that the new hospital at Seattle will open; also the new prison at Lewisburg, Pa., which will require a limited number of additional personnel.

Of the nurses on duty, 517 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, 23 are under the supervision of the Mental Hygiene Division, and 2 are under the supervision of the Scientific Research Division.

During the year, 130 nurses, 4 aides, and 8 dietitians were appointed; 17 nurses were reinstated; 2 nurses died; 37 nurses resigned, 19 to be married and 18 for other reasons; 28 nurses were released as not meeting the requirements of the service; and 19 nurses were discontinued at the expiration of temporary duty.

There are 29 dietitians in the service in 25 hospitals. The practice of requiring the chief nurse in the smaller hospitals to perform the duties of dietitian as well as those of chief nurse continues to prove satisfactory and gives a valuable experience to the nurse. Possibly two additional dietitians will be needed to staff the Seattle hospital.

There are 38 physiotherapy aides in the service assigned to hospitals and the larger out-patient offices. Additional aides will also be needed for the Seattle hospital.

The nursing section continued to administer the emergency rest-room service for employees at the bureau in Washington. There were registered in the emergency room this fiscal year 1,854 cases. Of this number 1,542 were from the Public Health Service, 242 Agriculture, 16 Census, 41 cafeteria, 13 others.

Contacts with nursing and health organizations and with health sections of women's associations have been maintained, and close cooperation with nursing schools and associations, etc., has been established and maintained as usual. Papers on the work of the service have been prepared and read.

The superintendent of nurses, in addition to attending State nurses' meetings, attended the American Nurses' Association Convention at San Antonio and on her return trip visited the new hospitals at Galveston and New Orleans, the leprosarium at Carville, La., the United States marine hospital at Mobile, and the hospital of the Federal prison at Atlanta. It is felt that through such visits a closer contact is maintained between the bureau and field and that a better knowledge of conditions and problems at the stations can be obtained.

Two nurses were assigned to duty with the Department of Agriculture during the 4-H encampment, June 13 to 23, 1932.

CONTRACT DENTAL SURGEONS

On July 1, 1931, 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, 2 were serving at various penal and correctional institutions, and 3 were detailed to the United States Coast Guard for duty.

EPIDEMIOLOGISTS

During the year the number of assistant collaborating epidemiologists decreased from 4,586 to 4,560. 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. The number of collaborating epidemiologists increased from 45 to 46, these appointees being on duty in the different States.

NATIONAL INSTITUTE OF HEALTH

The administration of the National Institute of Health for the fiscal year 1932 continued under the supervision of Director George W. McCoy and Assistant Director R. E. Dyer. The research staff comprised 57 persons, of whom 18 were commissioned officers and 11 part-time consultants. Assisting the staff were 17 technicians and 79 laboratory attendants and miscellaneous employees, making a total of 153.

Property Records

The property-return section has accounted for all property of the service and 325 property returns have been audited during the year. Sales of unserviceable property, including boats, hides, old paper, etc., aggregated $2,449.17. Surplus property not desired by any other Government department was sold for $115.75. Property surplus to the Public Health Service valued at $18,741.31 has been transferred to other Government departments. Surplus property of other departments valued at $6,184.49 has been received by the Public Health Service. Property valued at $39,946.75 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, $2,134.25 has been saved, and $762 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, 1932. Of the 10,844 employees shown in the table, 4,606 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 quarterly personnel report for the quarter ended July 1, 1932

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	Assistant surgeon					
Bureau	1		8	1	2	2											
FIELD																	
Hospital Division:																	
Marine hospitals—																	
Baltimore, Md		1			3		1					1	5	23		8	
Boston, Mass		1			1	2	3						4	11		5	
Buffalo, N. Y					1	1							4	8	1	2	1
Carville, La					1								4	4			1
Chicago, Ill		1			1								7	17		6	
Cleveland, Ohio		1			2		5						9	8		3	
Detroit, Mich					2	1							6	13		1	2
Ellis Island, N. Y					4							1	16	6		2	
Evansville, Ind					1								1	6	1		1
Fort Stanton, N. Mex					1		2						4	2			
Galveston, Tex					1		3						4	12	1	1	
Hudson Street, New York					3		7			1		1	11	17		1	1
Key West, Fla					1	1	1						2	1			1
Louisville, Ky		1											3	9	2	1	1
Memphis, Tenn					1								4	8	1	1	
Mobile, Ala					1	1				1			4	6			1
New Orleans, La					2	2	7						3	10		25	1
Norfolk, Va					2		3				1		4	6		13	
Pittsburgh, Pa					1		2						3	8		2	
Portland, Me				1		1	1					1	1	12			
Port Townsend, Wash					1								3				
St. Louis, Mo					1	1							3	16	1		
San Francisco, Calif		1			4	3	6			1			7	17		9	1
Savannah, Ga		1				1				2			8	8		1	
Seattle, Wash																	
Stapleton, Staten Island, N. Y		1			2	4	4			1			3	3		11	2
Vineyard Haven, Mass						1							1	1	1		
Total hospitals																	

Consolidated quarterly personnel report for the quarter ended July 1, 1932—Continued

Administisstrative 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
FIELD—continued																		
Hospital Division—Continued.																		
Relief stations—																		
Second class		2		2	3	2	5						19	44	10	1		
Third class													128	9	18			
Total relief stations																		
Foreign Quarantine Division:																		
Quarantine stations—																		
Baltimore, Md					1								1					
Boston, Mass					2								3					
Ellis Island (also immigration)		3		1	1	1							17					
El Paso, Tex													3					
Fort Monroe, Va		1					1											
Galveston, Tex													1					1
Honolulu, T. H		1				2							8					
Laredo, Tex													7					
Marcus Hook, Pa		1											1					
New Orleans, La					2		3						3					
Rosebank, N. Y		1		2	1		1						6	1				2
San Francisco, Calif. (also immigration)					1	2	1						3					
San Juan, P. R					1								2					
Foreign ports		5		4	6	14	2						40	3				
All other stations		1		1	8	5	2						167					1
Total quarantine and immigration																		

Domestic Quarantine Division:																	
Interstate					4	2	4										
Trachoma						1						5	4				
Rural sanitation (regular)					3	2	2					3	2				
Rural sanitation (drought)																	
All other stations		1			1												
Total, all activities																	
Scientific Research Division:																	
National Institute of Health		4		1	6	6	2						4				1
Leprosy investigations					1	1											
Malaria investigations				1	3	1											
Nutrition studies					1		1						1				
Stream pollution					2								6				
Industrial hygiene and sanitation				2		2	1						35				
Child hygiene												3	7				
Statistical office													5				
All other stations		1		1	4	2	2					2	34				
Total, all activities																	
Sanitary reports and statistics																	
Division of Venereal Diseases					1							46	9				
Division of Mental Hygiene:																	
Alderson, W. Va												7	2				
Atlanta, Ga						1	1				1	2	4		3		
Chillicothe, Ohio						1				1		2	5				
Fort Leavenworth, Kans					1	1	1				2	1	3		1		
Leavenworth, Kans						1						3	2		2		
Petersburg, Va												2		1			
McNeil Island, Wash					1					1	1	1	4				
All other stations					1		1					6	7	1			
Total, all activities																	
Miscellaneous:																	
Detailed to other offices		3		1	8	5	2					5					
Coast Guard		1			1	3	4			10	2	110		3			
Perry Point, Md. (supply station)							1										
Public health districts		6															
Waiting orders		4		12	8	2	1										
All others				1	1		1					1	3	1			
Total miscellaneous																	
Grand total	1	43	8	31	112	78	84			7	12	10	732	426	42	99	18

Consolidated quarterly personnel report for the quarter ended July 1, 1932

Administrative division and station	General and technical														Totals			
	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 employes	Departmental personnel	Medical and scientific	General and technical	Sub	Grand
Bureau														201	14	201		215
FIELD																		
Hospital Division:																		
Marine hospitals—																		
Baltimore, Md			1	1	26	3	2	1	2			6	72		42	114	156	
Boston, Mass			1	1	19	1		1	1			8	60		27	92	119	
Buffalo, N. Y					12	1	1		1			4	26		18	45	63	
Carville, La			1	1	1							6	263		10	272	282	
Chicago, Ill				1	18	1	2	1	1			8	59		32	91	123	
Cleveland, Ohio			2		34				1			9	104		28	150	178	
Detroit, Mich					16		1					5	49		25	71	96	
Ellis Island, N. Y			2	1	57	3	4	2	1			8	199		29	277	306	
Evansville, Ind					7							2	18		10	27	37	
Fort Stanton, N. Mex			1	1	10	3	2					9	114		9	140	149	
Galveston, Tex			1	1	16		1	1	1			5	40		22	66	88	
Hudson Street, New York				1	6	6		1	1			9	44		42	68	110	
Key West, Fla					11		1					4	27		7	43	50	
Louisville, Ky					8							4	23		17	35	52	
Memphis, Tenn				1	8			1				3	22		15	35	50	
Mobile, Ala					12	1			1			4	32		14	50	64	
New Orleans, La			1	1	61	4	5		2			31	177		50	282	332	
Norfolk, Va				1	29	1	2	1	1			8	91		29	134	163	
Pittsburgh, Pa				1	11	1						4	26		16	43	59	
Portland, Me			1		8							3	25		17	37	54	
Port Townsend, Wash			1		13							2	30		4	46	50	
St. Louis, Mo					10		1	1				4	31		22	47	69	
San Francisco, Calif			1	2	51	4	2	2	1			13	152		49	228	277	
Savannah, Ga			1	1	17		2		2			5	45		21	73	94	

Seattle, Wash.			2	1	38	4	3	2	1			10	123		31	184	215
Stapleton, Staten Island, N. Y.					3							1	8		4	12	16
Vineyard Haven, Mass.																	
Total, hospitals															590	2,662	3,252
Relief stations—																	
Second class			1		3	2			1			17	18		88	42	130
Third class												9			155	9	164
Total, relief stations															243	51	294
Foreign Quarantine Division:																	
Quarantine stations—																	
Baltimore, Md.			1							1	1		15		2	18	20
Boston, Mass.			1		1					2	2	1	20		5	27	32
Ellis Island (also immigration)												2	11		23	13	36
El Paso, Tex.												1	11		3	12	15
Fort Monroe, Va.										2	2	1	15		2	20	22
Galveston, Tex.										1	3		8		2	12	14
Honolulu, T. H.										2		1	20		11	23	34
Laredo, Tex.													13		7	13	20
Marcus Hook, Pa.			1		2					2	2	1	10		2	18	20
New Orleans, La.										3	1	1	22		8	27	35
Rosebank, N. Y.			3		1					6	6	7	112		14	135	149
San Francisco, Calif. (also immigration)					1					4	2	2	42		7	51	58
San Juan, P. R.											1	1	24		3	26	29
Foreign ports												6	34		74	40	114
All other stations			1	1	1					14	18	14	151		185	200	385
Total quarantine and immigration															348	635	983
Domestic Quarantine Division:																	
Interstate												4	43		10	47	57
Trachoma					10							2	7		10	19	29
Rural sanitation (regular)					126							41	333		12	500	512
Rural sanitation (drought)																	
All other stations												2	25		2	27	29
Total, all activities															34	593	627
Scientific Research Division:																	
National Institute of Health		34										12	82		24	128	152
Leprosy investigations												2	7		2	9	11
Malaria investigations												5	17		5	22	27
Nutrition studies					1								5		3	6	9
Stream pollution												3	17		8	20	28
Industrial hygiene and sanitation												10	14		40	24	64
Child hygiene						1						8	1		10	10	20
Statistical office					1							9	6		5	16	21
All other stations			1						1			12	61		46	75	121
Total, all activities															143	310	453

Consolidated quarterly personnel report fir the quarter ended July 1, 1932—Continued

Administrative division and station	General and technical														Totals			
	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
FIELD—continued																		
Sanitary reports and statistics	4,606												5			4,611		4,611
Division of Venereal Diseases									1			4	11		56	16		72
Division of Mental Hygiene:																		
Alderson, W. Va					5							1			9	6	15	
Atlanta, Ga			1		4								1		12	6	18	
Chillicothe, Ohio					3				1				1		9	5	14	
Fort Leavenworth, Kans			1		3								2		10	6	16	
Leavenworth, Kans			1	1	5								1		8	8	16	
Petersburg, Va					1								1		3	2	5	
McNeil Island, Wash					2										8	2	10	
All other stations			1										8		16	9	25	
Total, all activities															75	44		119
Miscellaneous:																		
Detailed to other offices															24		24	
Coast Guard															134		134	
Perry Point, Md. (supply station)												4	6		1	10	11	
Public health districts			2									6			6	8	14	
Waiting orders															27		27	
All others															8		8	
Total miscellaneous															200	18		218
Grand total	4,606	34	31	18	672	36	29	14	21	37	38	364	3,040	201	1,703	9,141		10,844

CHIEF CLERK'S OFFICE

BUREAU PERSONNEL

At the end of the fiscal year 1932 the number of civil service employees on duty in the bureau was 201. Of these 179 were paid from the appropriation, "Salaries, Office of the Surgeon General," 12 from the appropriation for the Division of Venereal Diseases, and 10 from the appropriation for the Division of Mental Hygiene. During the year there was a decrease of 1 employee in the Division of Venereal Diseases, 1 in the chief clerk's office, and an increase of 2 employees in the Division of Foreign and Insular Quarantine and 2 in the Division of Mental Hygiene. The record for punctuality was almost perfect, there being an average of but 1 case of tardiness per employee for the entire year. The average sick leave was 8.1 days per employee, which was a slight increase over that for the preceding year.

During the year the following employees were retired: Mrs. E. Anna Draper, on July 31, 1931, after a service of 23 years; Mrs. Mary L. Guy, on August 31, 1931, after a total service of 40 years and 5 months; and Mrs. Antonia T. Converse, on March 31, 1932, after a total service of 15 years. No administrative promotions were made during the fiscal year.

PRINTING AND BINDING

The fund of $93,000 available for printing and binding again proved insufficient for the printing of all of the public health publications which were made ready for issue, and a number of valuable manuscripts remained unpublished at the end of the year. Every effort for economy was exerted in order to render the available funds as effective as possible.

PUBLIC HEALTH SERVICE LIBRARY

The library contains at present 13,207 bound volumes and a collection of pamphlets numbering approximately 7,075. During the year 435 volumes were added, of which 70 were purchased, the remainder consisting of gifts and the bound volumes of periodicals and serials. The number of additional pamphlets received is estimated at 275.

Periodicals to the number of 250 were received regularly and circulated to the persons interested. Of these, 36 were obtained through paid subscriptions, the others being received gratuitously or in exchange for Public Health Reports. In addition, about 150 monthly and weekly bulletins from State, city, and foreign health departments were received regularly. As the library has grown and developed, the utilization of its facilities by public health workers has steadily increased.

NEW ADMINISTRATIVE BUILDING AT WASHINGTON

Excavations for the foundation of the new building were begun in July, 1931, and the completion of this structure is expected early in the calendar year 1933. Its occupancy will greatly facilitate the administrative work of the service, which now occupies quarters in the temporary buildings in the Mall group.

APPENDIX

FINANCIAL STATEMENT

The following is a statement of expenditures from appropriations of the Public Health Service for the fiscal year 1932:

Appropriation	Appropriated	Obligations			Unobligated balance
		Incurred	Liquidated	Outstanding	
Salaries, Office of Surgeon General	$340,135.00	$338,347.33	$338,347.33		$1,787.67
Pay, etc., commissioned officers and pharmacists	1,437,548.00	1,418,763.55	1,417,389.05	$1,374.50	18,784.45
Pay of acting assistant surgeons	397,984.00	362,394.21	361,466.25	927.96	35,589.79
Pay of other employees	1,122,090.00	1,081,421.82	1,081,087.64	334.18	40,668.18
Freight, transportation, etc.	29,000.00	27,709.46	21,022.81	6,686.65	1,290.54
Maintenance, National Institute of Health	48,000.00	46,760.90	44,622.46	2,138.44	1,239.10
Books	500.00	496.87	474.34	22.53	3.13
Pay of personnel and maintenance of hospitals	[1] 8,060,738.00	7,709,983.28	7,434,550.39	275,432.89	350,754.72
Quarantine service	617,150.00	466,887.91	330,627.91	136,260.00	150,262.09
Preventing the spread of epidemic diseases	400,000.00	293,894.79	275,763.67	18,131.12	106,105.21
Field investigations of public health	456,700.00	443,827.88	423,607.04	20,220.84	12,872.12
Interstate quarantine service	68,040.00	66,091.33	65,099.88	991.50	1,948.62
Studies of rural sanitation	338,000.00	335,700.00	316,279.80	19,420.20	2,300.00
Studies of rural sanitation, drought-stricken areas	[2] 1,611,372.69	1,598,130.95	1,589,356.34	8,774.61	13,241.74
Control of biologic products	46,620.00	44,937.45	44,091.57	845.88	1,682.55
Expenses, Division of Venereal Diseases	100,000.00	89,207.34	87,971.80	1,235.54	10,792.66
Expenses, Division of Mental Hygiene	50,515.00	47,973.94	47,868.91	105.03	2,541.06
Educational exhibits	2,500.00	2,222.74	2,077.87	144.87	277.26
Total	[3] 15,126,892.69	14,374,751.80	13,881,705.06	493,046.74	752,140.89

[1] Includes $1,396,259 reimbursement for care and treatment of beneficiaries of the Veterans' Administration.
[2] Balance available July 1, 1931, of $2,000,000 appropriated for 1931 and 1932.
[3] Statement does not include expenditure of $4,166.60 from trust fund "National Institute of Health, Conditional Gift Fund."

Quarantine service—Expenditures by stations

Name of station	Pay of officers and employees	Maintenance	Total
CONTINENTAL QUARANTINE STATIONS			
Baltimore, Md	$34,190.24	$17,660.61	$51,850.85
Beaufort, S. C	775.00		775.00
Biscayne Bay (Miami), Fla	16,842.98	3,208.29	20,051.27
Boca Grande, Fla	1,925.00	70.00	1,995.00
Boston, Mass	47,440.02	58,480.22	105,920.24
Brownsville, Tex	17,358.72	2,957.66	20,316.38
Brunswick, Ga	3,270.00	2,079.92	5,349.92
Cape Fear (Southport), N. C	8,250.00	2,988.11	11,238.11
Charleston, S. C	20,565.46	4,573.38	25,138.84
Columbia River (Astoria), Oreg	7,260.00	2,063.66	9,323.66
Corpus Christi, Tex	2,100.00	310.24	2,410.24
Cumberland Sound (Fernandina), Fla	2,199.96		2,199.96
Delaware Bay and River (Philadelphia), Pa	12,360.00	3,942.23	16,302.23
Delaware Breakwater (Lewes), Del		4.25	4.25
Del Rio, Tex	5,880.00	1,057.94	6,937.94
Eagle Pass, Tex	16,500.06	1,320.29	17,820.35
El Paso, Tex	28,850.34	3,698.81	32,549.15
Eureka, Calif		5.00	5.00
Fort Pierce, Fla	10.00		10.00
Freeport, Tex	450.00		450.00
Galveston, Tex	26,086.80	8,989.76	35,076.56
Georgetown, S. C	35.00		35.00
Gulfport, Miss	5,899.92	390.07	6,289.99
Hidalgo, Tex	7,404.82	900.09	8,304.91
Key West, Fla	4,304.33	406.21	4,710.54
Laredo, Tex	29,536.08	3,423.96	32,960.04
Marcus Hook, Pa	39,288.92	10,888.38	50,177.30
Mercedes, Tex	3,143.49	825.58	3,969.07
Mobile, Ala	25,675.40	8,805.06	34,480.46
New Bedford, Mass		108.18	108.18
New Orleans, La	67,312.15	100,965.90	168,278.05
Newport, R. I		15.00	15.00
New York, N. Y	244,853.48	78,353.01	323,206.49
Nogales, Ariz	8,700.00	1,680.29	10,380.29
Norfolk (Fortress Monroe), Va	37,574.69	10,965.20	48,539.89
Pascagoula, Miss	1,200.00		1,200.00
Pensacola, Fla	16,968.59	2,454.16	19,422.75
Perth Amboy, N. J		1,200.00	1,200.00
Port Aransas (Aransas Pass), Tex	45.00		45.00
Port Arthur, Tex	9,360.00	138.57	9,498.57
Portland, Me	15,939.86	8,799.02	24,738.88
Portland, Oreg	5,636.40	1,419.13	7,055.53
Port Townsend, Wash	15,019.92	2,893.78	17,913.70
Presidio, Tex	5,475.91	1,027.21	6,503.12
Providence, R. I	1,860.00	792.25	2,652.25
Reedy Island (Port Penn), Del	9,073.97	3,072.33	12,146.30
Rio Grande, Tex	4,640.00	125.13	4,765.13
Roma, Tex	5,389.63	732.59	6,122.22
Sabine, Tex	14,219.92	1,698.25	15,918.17
St. Andrews (Panama City), Fla	1,200.00	82.80	1,282.80
St. Georges Sound (Carrabelle), Fla	300.00		300.00
St. Johns River (Jacksonville), Fla	7,982.46	1,362.72	9,345.18
San Diego (Point Loma), Calif	15,659.93	4,932.29	20,592.22
San Francisco (Angel Island), Calif	76,564.29	35,583.97	112,148.26
San Pedro (Los Angeles), Calif	35,305.10	10,408.70	45,713.80
Savannah, Ga	20,267.94	7,399.29	27,667.23
Seattle, Wash	12,379.92	2,478.44	14,858.36
Tampa, Fla	16,126.42	6,890.19	23,016.61
Vineyard Haven, Mass		20.00	20.00
Ysleta, Tex		17.20	17.20
Zapata, Tex	2,340.00	545.75	2,885.75
Freight and miscellaneous		20,000.00	20,000.00
Travel of medical directors within districts		930.29	930.29
Total, continental quarantine stations	1,018,998.12	446,141.36	1,465,139.48
INSULAR QUARANTINE STATIONS			
Hawaii	43,717.89	8,213.50	51,931.39
Puerto Rico	39,986.92	9,125.07	49,111.99
Virgin Islands	13,960.16	3,407.98	17,368.14
Total, insular quarantine stations	97,664.97	20,746.55	118,411.52
Total, all stations	1,116,663.09	466,887.91	1,583,551.00

MISCELLANEOUS RECEIPTS

COVERED INTO THE TREASURY

The revenues derived from operations of the Public Health Service during the fiscal year 1932 are as follows:

Source	Amount
GENERAL FUND RECEIPTS	
Quarantine charges	$290,168.03
Hospitalization charges and expenses	38,630.67
Sale of subsistence	13,049.62
Laundry service	62.70
Sale of occupational therapy products	339.97
Sale of obsolete, condemned, and unserviceable equipment	2,392.45
Rents	239.48
Reimbursement for Government property lost or damaged	192.92
Commissions on telephone pay stations installed in service buildings	1,343.01
Sale of refuse, garbage, and other by-products	1,398.11
Sale of livestock and livestock products	278.96
Other revenues	128.95
Total, general fund receipts	348,224.87
TRUST FUND RECEIPTS	
Effects of deceased patients	7,468.07
Grand total	355,692.94

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 1932 are as follows:

Appropriation	Transferred to Public Health Service	Obligated
Veterans' Administration:		
Salaries and expenses, Veterans' Administration	$1,408,982.60	$1,408,982.60
District of Columbia:		
Mosquito control in the District of Columbia	6,500.00	5,943.84
Department of Justice:		
Federal Industrial Institute for Women, maintenance	45,360.00	30,111.87
Federal jails	12,878.00	10,537.37
Prison camps	24,870.00	23,564.45
United States industrial reformatory, Chillicothe, Ohio	44,530.00	41,211.62
United States penitentiary, Atlanta, Ga	57,080.00	56,643.61
United States penitentiary, Atlanta, Ga., buildings and equipment	34,920.00	33,446.56
United States penitentiary, Leavenworth, Kans	101,213.00	94,137.70
United States penitentiary, McNeil Island, Wash	58,502.00	51,509.12
Total, Department of Justice	379,353.00	341,162.30
Grand total	1,794,835.60	1,756,088.74

INDEX

A

B

C

D

T

U

V

W

Y

Z