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ANNUAL REPORTS

of the United States Public Health Service

FOR THE FISCAL YEARS

1941-42

1942-43

FEDERAL SECURITY AGENCY . . . . . PAUL V. MCNUTT, *Administrator*

U. S. PUBLIC HEALTH SERVICE . . . THOMAS PARRAN, *Surgeon General*

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LETTER OF TRANSMITTAL

FEDERAL SECURITY AGENCY,
U. S. PUBLIC HEALTH SERVICE,
Washington, D. C., November 1, 1943.

The Honorable PAUL V. MCNUTT,
Federal Security Administrator.

SIR:

In accordance with the act approved July 1, 1902 (U. S. C., title 42, sec. 4), I have the honor to submit for transmission to Congress the seventy-first and seventy-second annual reports of the United States Public Health Service for the fiscal years ended June 30, 1942, and June 30, 1943.

Respectfully,

THOMAS PARRAN,
Surgeon General.

FOREWORD

The first year of war has given the health authorities of the United States an opportunity to test their pre-war health protective measures, and to see more clearly the problems which lie ahead.

The health of the nation, as measured by death rates and the incidence of communicable diseases, remained good during 1942. Provisional data indicate that the general death rate for 1942 is the lowest ever recorded, 10.3 per 1,000 population, as compared to 10.5 for 1941. It is probable that final figures will also show a decrease in maternal mortality for the thirteenth consecutive year, reaching an all-time low of about or less than 3 deaths per 1,000 live births. Infant mortality decreased to 40 or 41 per 1,000 live births in 1942, as compared to 45 in 1941. At the same time, the birth rate rose from 18.7 per 1,000 population in 1941 to 20.7 in 1942.

There were no major outbreaks of epidemic disease in the United States and its territories during 1942. In fact, some of the common diseases like typhoid fever and influenza receded below the peace years. It is true that many small outbreaks of dysentery and food poisoning gave concern to local authorities; here and there smallpox flared up, but was brought quickly under control. Most of these sporadic outbreaks occurred in military or industrial areas where crowding, in-migration, and other familiar war conditions exist.

There were, however, substantial increases in 2 epidemic diseases and an outbreak of a new infection among war workers. We all remember that meningococcus meningitis, commonly known as cerebrospinal fever, caused great loss of life among the armed forces and civilians during the last war. In 1942, nearly 4,000 cases were reported as compared to between 1,500 and 2,000 for the preceding years 1939 to 1941. During the first 9 months of 1943, some 14,500 cases have been reported.

Meningococcus meningitis is spread by contact with infected persons; it is primarily a disease of crowding and poor ventilation. Thus, its rapid spread under war conditions is understandable. Twenty-five years ago we had no satisfactory treatment. The situation today is very much more hopeful. It has been found that prompt treatment with the sulfa drugs alone will save a great majority of the patients. In some reports to the Public Health Service, the fatality has been as low as 5 percent.

Endemic typhus fever also increased in 1942 when 3,700 cases were reported and current reports for 1943 show a continued rise. The disease is spread by the bite of the rat flea. The principal foci of infection are in Texas and Georgia; however, for a number of years, the disease has been gradually spreading northward along the Eastern coast and along the granary lines in the Middle West.

Following the last war, more people died in Europe of typhus fever, other diseases and starvation than were killed in the war itself. This Old World type is spread by the body louse.

We anticipate that at the end of this war with starvation widespread in many lands, with the probable destruction of hospitals and other medical facilities, and the complete disorganization of civil governments, the situation may be much worse. We have been carrying on research in connection with this disease for a number of years, and have intensified our efforts in two directions: (1) One of our officers, Dr. Cox, has developed a vaccine which we believe to be the

most effective vaccine for the prevention of typhus fever of any so far discovered; proof awaits the test of a major outbreak; (2) experiments in the production of lice repellants are encouraging. To promote control efforts in this country, a field office of Typhus Fever Control has been established with headquarters in Atlanta, Ga.

During the latter part of 1941, an epidemic eye infection, new in this country, appeared in shipyards on the West Coast. This disease, known as epidemic kerato-conjunctivitis, spread very rapidly through large war industries there and in 1942 attacked industrial groups in New York, Connecticut, Wisconsin, Michigan, and other midwest areas. Reports to the Public Health Service indicate that at least 2,000 cases occurred. The probable cause of the disease is a virus. It is not a fatal infection, but in its ordinary course it disables the workers from 2 to 8 weeks, and occasionally impairs vision through injury to the cornea. The Public Health Service has been in close contact with State and local authorities, industrial physicians and the medical profession. The condition has been widely publicized among the professions and recommendations have been made for its control.

The great impetus of air traffic in global war has posed difficult problems for our quarantine authorities. The increased speed of travel has made it possible for a person to contract any of the quarantinable or tropical diseases in distant parts of the world and reach the United States before the conditions will have become manifest.

All flights of commercial aircraft land at designated airports of entry. The passengers are examined by medical officers for presence of disease, and those arriving from areas where yellow fever may be present are kept under surveillance until the incubation period has expired. Because of the possibility of aircraft transporting insect vectors of plague, yellow fever, typhus, and other infectious diseases, all planes are disinsecticized once before arrival by flight personnel and on arrival by the Public Health Service.

Flights of the aircraft of our armed forces enter so many military posts from foreign areas that it has become necessary to designate certain senior medical officers of the posts as quarantine officer, with the attendant responsibilities.

The new ships constructed for our wartime merchant marine incorporate the Public Health Service ratproofing specifications. Before the ship is launched, there is a final inspection by one of our sanitary inspectors, and if ratproofing requirements are not met, alterations are made in accordance with the inspector's recommendations. Ratproofing effects a considerable saving in cost of construction and, what is probably more important, an appreciable reduction in the quantity of steel used.

Reports of infectious diseases from enemy occupied countries are incomplete. During 1942 typhus fever is known to have been epidemic in North Africa, Bulgaria, France, Germany, Hungary, Rumania, Spain, and Turkey. Reports from many other countries were lacking. The League of Nations reports state that there were nearly 4,000 cases of typhus fever in Germany during the first 9 months of 1942, and that typhoid was prevalent in Northern Italy. In September of 1942 the Germans ceased to issue figures. In 1942 there were 35,000 cases of typhus fever reported from Algeria, 23,000 from

Egypt, 26,000 from Morocco, and 16,000 from Tunisia. A recent report from the Typhus Commission shows that the disease is less prevalent this year than last.

Recent consular reports show that gastroenteritis, tuberculosis, typhoid fever and trachoma are also prevalent in North Africa. In one month, 1,061 new cases of malaria were reported in Morocco. In Egypt, over 4,000 cases of malaria were recently reported as under treatment with an average of 1,000 new cases each week.

The problem of returning troops infected with various tropical diseases has been studied by the Public Health Service, the Army, the Navy, and the National Research Council. There is a very real possibility that exotic diseases unknown in this country may be introduced by returning troops and gain a foothold in the United States. The fundamental problem is that the parasites are carried by intermediate hosts such as insects. For example, filariasis—a stubborn disease of the lymph glands for which there is no preventive treatment and no sure cure—is transmitted by the bite of mosquitoes. Since a victim of filariasis may be a carrier for years, it would be relatively easy for a mosquito host to establish the infection in this country. At the present time, we know of only one mosquito host in this country capable of transmitting filariasis (*Culex quinquefasciatus*). We must now begin to scrutinize our mosquito population to determine whether other common pests could become vectors.

Likewise, schistosomiasis, prevalent in Africa, Central and South America, and the West Indies, could readily become established in the United States. This is a disease of the intestinal tract caused by parasites which are excreted by snails in rural water supplies. The snails acquire the parasites from soil and water contaminated with human waste. This, too, is a stubborn long-term disease. We must now use every effort to discover whether the snails indigenous to the United States are capable of becoming vectors of the schistosomes.

Despite the threat of epidemic diseases to the war effort, their prompt control constitutes but a small part of the wartime task of the Public Health Service. In fact, it is safe to say that 90 percent of Public Health Service's resources, in manpower, matériel and money, have been channeled into direct war work. For example, virtually all research of the National Institute of Health has been turned to new problems arising from the conditions of global war. The few remaining studies are essential to the preservation of our continuing search for knowledge upon the diseases of mankind. Cancer studies fall into this category. In our hospitals, nearly 80 percent of the patients, in 1942 and up to the present time, have been members of the Merchant Marine, the Coast Guard, Army and Navy.

The Public Health Service furnishes medical care for the entire personnel of the Coast Guard in the same way that the Navy Medical Corps provides medical care for the personnel of the Navy.

Coast Guard patients treated in Marine and contract hospitals increased from 7,082 in 1941 to 16,167 in 1942. An increasing number of women and children are applying for admission to the Marine hospitals. Many who seek treatment are dependents of Coast Guard and Coast and Geodetic Survey personnel. Still others are veterans and beneficiaries of the Employees' Compensation Commission. Many of the latter group are received from arsenals and other Government plants where they are engaged in hazardous activities.

At the request of the War Shipping Administration, which is engaged in a large program of training both officers and seamen, the Public Health Service is supplying complete medical service for that administration.

For the first time in the history of the United States, a serious attempt is being made to give merchant ships the services of hospital corpsmen. Formerly a vast majority of seagoing merchant vessels had no first aid or sanitation service of any kind. The United States Marine Hospital Corps School in Brooklyn, N. Y., graduated its first class of 239 pharmacists mates on March 12, 1943, after 6 months of intensive training. They are being assigned to oceangoing vessels where they will have charge of the ships' first aid, health, and sanitation program.

The War Shipping Administration and the Public Health Service are also working on a joint program for the prevention and treatment of psychic effects of enemy attack on merchant seamen—war neuroses or combat fatigue. These men are now being treated and rehabilitated so that many of them are going back to their ships after a few weeks of convalescent care.

At the request of the Secretary of War, a number of medical officers have been assigned to duty with the Army. Liaison officers have been continued in each of the 10 Service Commands.

The entire staff of the Public Health Service Medical Commission to China is now serving with the Army in India, under the command of General Stilwell, having been reassigned to this duty when the Japanese overran Burma.

A United States Typhus Commission was established in the War Department by Executive order on December 24, 1942. Its function is to study typhus and its control within and without the United States whenever it becomes a threat to American troops. The Commission now overseas is composed of medical officers of the Army, Navy, and the Public Health Service and other experts.

At the request of the Army, officers from the Public Health Service are now in training at the School for Military Government in Charlottesville, Va., and others have been assigned to foreign missions.

At the outbreak of war, we had six medical officers in quarantine duty in the Philippine Islands. The commanding general immediately asked that they be transferred to the Army to become a part of the Medical Corps of the Army. Five of these doctors have been reported prisoners of war and the sixth is now medical aide to General MacArthur in Australia.

We have medical officers on duty in Panama with the Army in connection with venereal disease control and other health problems, and more recently we have assigned additional officers to serve with the Army in Trinidad and with the Anglo-American Commission.

Our medical and engineer officers are giving medical care and supervising the sanitation work on the Alaska Highway.

At the request of the Chief of Ordnance of the Army, two industrial hygiene experts are serving with the Ordnance Safety Branch.

Five medical officers have been assigned to supervise epidemic control and other health problems in North Africa at the request of General Eisenhower and Mr. Robert Murphy. The senior officer is chief medical advisor to Mr. Murphy. Additional medical and sanitary engineering officers are scheduled for duty there.

The recently created Office for Foreign Relief and Rehabilitation under Governor Lehman has requested us to assign a chief medical officer and to undertake the recruitment and training of the medical and sanitary personnel which will be needed in connection with the work of that office.

Our cooperative work with the Pan American Sanitary Bureau has grown in amount and complexity. A number of our officers are assigned to this duty in different parts of South and Central America in connection with the prevention of the spread of disease from one country to another and to this country. That work is assuming increasing importance because of the presence of our military forces in certain of these areas and elsewhere in the Americas.

A group of our medical and engineer officers is supervising sanitary conditions along the Pan American Highway, which may become of great military importance in connection with the movement of troops.

In 1942, the Surgeon General attended the Pan American Congress on Agriculture in Mexico City and served as Chairman of the Delegates of the United States at the Eleventh Pan American Sanitary Conference in Rio de Janeiro. From a number of Latin American countries outstanding health accomplishments were reported, particularly the extermination of the yellow fever mosquito in all port cities of Brazil and parts of Peru and of a vicious malaria mosquito previously imported from West Africa to Natal.

Public Health Service personnel employed under the Emergency Health and Sanitation Appropriation are now working in 202 specific war areas on assignment to the States. Others are assigned to special regional programs and to liaison work of an emergency nature. As of January 1, 1943, the total personnel employed with these funds was 4,340. Although more than 3,000 were laborers employed on malaria control work, the remaining emergency health and sanitation personnel, numbering approximately 1,000 were engaged in general public health work, industrial hygiene services, typhus control, yellow fever control, tuberculosis control, and administration of the civilan defense blood plasma bank program. With available funds only the most critical needs can be met.

The Public Health Service has had the primary responsibility for the control of malaria in all areas adjacent to naval and military establishments. This work has involved the organization of a very considerable group of doctors, engineers, entomologists, and other personnel for those purposes.

We have created a zone essentially free of malaria mosquitoes around every military camp and every war industry. It is gratifying to report that, as the result of these control activities, during 1942, the Army experienced the lowest malaria rate in its history—0.6 per 1,000 men per year.

At the request of the Navy, we are controlling the breeding of the mosquito which transmits dengue and yellow fever at Key West, Fla., in Texas and South Carolina. Similar work is needed in other areas along the Atlantic Seaboard.

For a number of years we have been concerned with the problem of yellow fever. This problem has grown more acute, as a result of the war, with the coming and going of planes from unpredictable origins in West Africa and certain areas in South America where the disease

is present. Vaccine has been produced for this disease. We have been manufacturing large quantities of it at the direct request of the War Department, and at the present time we are supplying yellow fever vaccine to immunize the troops.

General health conditions around all Army and Navy installations are also the responsibility of the Public Health Service. The control of epidemics and the maintenance of sanitary conditions in extra-cantonment and war industrial areas, not only in this country but around some of the outlying bases, also fall upon the Public Health Service.

Traditionally war and the venereal diseases go hand in hand. In the first World War, there was a great increase in the venereal diseases, not only among the warring nations but among neutrals as well. In this war, Great Britain has experienced a rising venereal disease rate although the levels there were quite low before the war. In that country in 1942, the Minister of Health reported a 70 percent increase of syphilis over 1938 if military infections are included. In this country, there was a 20 percent increase last year in the number of patients admitted to clinics, and also an increase in the number of cases reported by private physicians. A large part, possibly all, of this increase can be accounted for by the great increase in serologic tests and general intensification of case-finding throughout the country. In the current year, for example, it is estimated that 30,000,000 serologic tests will be made. We cannot overlook the possibility, however, that some of the increase in cases found may be due to an increased total of infections.

The number of venereal disease clinics in the United States represents an increase of 300 percent over 1938. Nearly 10,600,000 syphilis treatments were given by public health doctors, an increase of 260 percent over 1938. All indices of control activity in 1943 show an upward trend. With the aid of additional funds furnished last year by the Congress, many communities caught in the war boom with absolutely no defense against the venereal diseases have been aided. Of the many thousands of men rejected for military service on account of venereal disease infection, 64 percent have been brought under treatment. Work is now in progress to check accurately the treatment status of each person rejected on account of a venereal disease and to bring the present physical eligibility of these individuals to the attention of the local draft board.

For the treatment and rehabilitation of women spreading venereal disease, rapid treatment centers have been established. They are financed jointly by Lanham Act and Public Health Service funds. Treatment includes the new intensive methods for treating syphilis and the use of sulfa drugs for gonorrhea. The newer treatment methods for syphilis, varying in length from 1 day to 6 weeks, give great promise and may supplant traditional methods. Within the next year, we should have an accurate appraisal of the value of these several intensive methods. Moreover, it is now possible with sulfa drugs to cure 80 to 90 percent of all gonorrhea cases in a week's time.

During the last war, deaths from tuberculosis increased greatly in all countries, both neutral and belligerent. In Great Britain the mortality rate has already increased by 114 percent since 1939. In anticipation of a similar rise in the United States, the Public Health Service established a Tuberculosis Control Section shortly after war

began. Its principal objective is to prevent a rise in tuberculosis mortality during wartime by covering the greatest number of people in the shortest time with all governmental and voluntary resources and personnel, and to lay the foundation of a post-war program for the ultimate eradication of tuberculosis in the United States.

Although there has been as yet no apparent increase in the amount of tuberculosis in this country, the objective circumstances favoring such an increase are much in evidence. These include overcrowding, longer hours of work with resulting fatigue, and emotional strain.

Since the outbreak of the war, the United States Public Health Service has given X-ray examinations to over a quarter of a million people. The groups examined included over 160,000 workers in war industries located in 9 States, and some 40,000 Federal employees in the District of Columbia. It is planned to extend the program to include the families of war workers and rejectees from the armed forces. Routine X-ray examination of patients in the admitting rooms of general hospitals and hospitals for the mentally ill is also recommended.

In addition to providing X-ray examinations, the Public Health Service offers to State and local health departments professional services for the appraisal and reorganization of their tuberculosis control work in order to strengthen Nation-wide control of this disease, and assist the medical departments in developing programs for follow-up and treatment of these newly discovered patients.

If we are to hold tuberculosis in check, we must expand our program. More small-film units must be added and the units now in operation must be staffed with sufficient personnel to operate more than one shift a day.

With the tremendous growth in industry there has been a correspondingly increased need for looking after the health of the workers in the shipyards and in the munitions plants, and for the expansion of health and sanitation activities in all war industrial areas. For many years, we have carried out studies on industrial hygiene. These have now been expanded, field staffs have been organized, and intensive programs have been instituted to insure the health of industrial workers. This is done by direct inspections of plants, especially Government arsenals, and through 44 industrial hygiene units (36 States, 4 cities, 2 counties, the Tennessee Valley Authority, and the District of Columbia). The work of the State units is so integrated with that of the Public Health Service that a Nation-wide organization now exists which, if properly implemented, can serve effectively to guard the health of war workers.

In addition to reviewing and certifying hospital and sanitation projects, technical assistance was given to the Federal Works Agency and the Federal Public Housing Authority in connection with construction projects, and to the War Production Board in the review of applications for priorities for materials, equipment, and supplies needed in the health and sanitation fields. At the request of the Federal Public Housing Authority, we are providing nurses and doctors for infirmaries in the Federal housing projects and dormitory projects.

Other agencies, too, have called on the Public Health Service for aid. We have recruited and assigned medical, nursing and engineering personnel which staffs the Emergency Medical Services of the Office of Civilian Defense. In addition to a chief medical officer, and a staff

in Washington, medical and engineer officers are on duty in all of the service commands and in a number of the coastal States. A part of this work has involved the organization of emergency base hospitals which are available for the use of civilians in the event of enemy action or other severe catastrophe.

We have been called on more and more by the military authorities for research work. These studies include an effort to find a preventive for malaria, many intricate problems involved in combat flying, improvement in typhus fever vaccine, and other studies which for military reasons cannot be reported. Suffice it to say that the military authorities consider these studies of urgent importance.

Research is constantly going on as to the toxicity and potential dangers of new substances prior to their introduction into industry. These studies are of the utmost industrial importance at this time.

Recently a member of the staff of the National Cancer Institute has succeeded in transforming normal cells grown artificially in the test tube into cancer cells by exposing the cultures to extremely small amounts of a coal-tar chemical which has long been known to induce cancer when injected into experimental animals. The transformed cells when reinjected into animals of the same species from which they were derived have grown rapidly, invading the other tissues of the body and finally killing the animals.

It is probable that this contribution will lead ultimately to the discovery of the cause of cancer, since it demonstrates conclusively that the cancer process is started in individual cells and is not dependent upon constitutional conditions of the whole body.

A method for relieving the pain of childbirth was developed by two young officers of the Service at the Marine Hospital in Stapleton, N. Y., in the past year. Leaders in the medical profession consider this an outstanding contribution. It is an application of the principles of local anesthesia in that it is essentially a process whereby the larger nerves supplying the part of the body involved remain anesthetized throughout the period of painful labor. Mothers remain completely conscious throughout, and, having experienced it, are most enthusiastic. The baby being born is not at all affected. Physicians who have witnessed demonstrations are very greatly impressed.

The technique is somewhat difficult and requires special ability on the part of the physician. The method is known as continuous caudal analgesia. Possibilities exist for its use in fields of medicine other than obstetrics. The originators have demonstrated their technique at a number of medical schools and are receiving many requests for additional demonstrations.

There is an insufficient number of nurses to meet military and civilian needs. For the past 2 years, the Public Health Service has attempted to increase the supply of nurses in order to meet the needs of the Army, Navy, and civilian health agencies. The Congress appropriated $1,800,000 for the fiscal year 1942, and $3,500,000 for the fiscal year 1943. The goals which were possible within the limits of these appropriations were reached.

In the nurse training program for 1941 to 1943, payments were made only when the school could show an increase in the number of

students admitted. A more comprehensive approach was needed to assure an adequate supply of nurses for the Army, Navy, and essential civilian service. Under the Bolton Act, approved by the President June 14, 1943, it will be possible to expand the use of existing facilities by accelerating the basic training period, to recruit large numbers of young women through the incentive of free tuition, maintenance, fees, uniform, and a monthly stipend.

A very large problem has developed recently with regard to the provision of medical care in certain boom war-industry areas, which have grown rapidly, almost overnight, from small villages into cities of considerable size. In many of them, there is an urgent shortage of doctors and dentists. Whenever it is impossible to meet the needs for medical care through the Procurement and Assignment Service, the Public Health Service is called upon to meet them.

Approximately one-third of the doctors in active full-time practice in the United States have entered the armed services since the war began. According to reports from State procurement and assignment chairmen, as of March 23, 1943, 286 additional doctors for civilian practice are needed in 176 counties located in 38 States. Another 22 counties in the same States report a shortage of physicians but do not specify the number needed. In the remaining 10 States, no needs were reported. Although the 198 counties reporting immediate needs represent only 7 percent of the 2,654 counties in the 38 States, and only 6 percent of all counties in the country, it is apparent that civilian communities are feeling the pinch of the physician shortage increasingly, since experience has shown that local needs become acute before they are expressed in formal reports.

On the basis of studies already made, it is estimated that 600 physicians and dentists will be needed in boom areas by the close of 1944. It is not possible to predict how many will be supplied by voluntary relocation through the efforts of Procurement and Assignment Service. When the need cannot be met in this way, the Public Health Service will be requested to assign doctors for the worst areas.

We cannot at this time predict the needs of certain rural areas, which may now be adequately supplied but which will require additional public health and medical services during 1943, through death or disability of the remaining elderly doctors, or because the Government moves a large number of farm families into these areas for the food production drive.

Civilian medical care has deteriorated in most parts of the country. The situation will worsen in the months ahead. There is a critical shortage of doctors now in some areas.

The United States cannot afford to give up the *essential* health and medical services in wartime. But as in other civilian activities, we must give up luxury services. The basic public health protection must be maintained. The public health program makes possible the most economical use of medical and technical manpower, equipment, and scarce drugs. In war as in peace, the objective of public health is to put to the maximum use all available resources for the conservation and promotion of the Nation's health.

THOMAS PARRAN,
Surgeon General.

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ANNUAL REPORT, 1942

Office of the Surgeon General

Medical Director WARREN F. DRAPER, Assistant to the Surgeon General
Medical Director L. R. THOMPSON, Chief Inspection Officer

WITH THE ADDED RESPONSIBILITIES of the Public Health Service and the manifold relationships with other Federal agencies, the Office of the Surgeon General has accepted new duties and has become increasingly an administrative entity in its own right. The 11 liaison officers of the Public Health Service assigned to the 10 Army Service Commands and to the Military Department of Puerto Rico report to the Office of the Surgeon General, as do the directors of the 9 district offices of the Public Health Service.

On February 1, 1942, Medical Director L. R. Thompson was appointed Chief Inspection Officer of the Public Health Service. This position was established in the Office of the Surgeon General in order to coordinate the activities of the district offices and liaison officers.

An Emergency Medical Section was established to service the medical program of the Office of Civilian Defense. Approximately 100 Public Health Service personnel, including many commissioned officers, have been assigned to the Office of Civilian Defense. The Emergency Medical Section is responsible for the recruitment of civilian physicians to form affiliated units in defense areas. These physicians are then commissioned in the reserve corps of the Public Health Service, and are available for active duty in the event of disaster due to enemy action. Several hundred such officers have already been commissioned.

The section also administers Public Health Service funds for the medical care of civilians injured by enemy action or needing such services after evacuation from a combat zone. Likewise, this section is responsible for the medical care of members of the protected services of the Office of Civilian Defense who may be injured by enemy action or by accidents during training or practice. The establishment of blood plasma banks in civilian hospitals for the emergency treatment of civilians in the event of disaster is also administered by the Emergency Medical Section.

District Offices

Effective August 1, 1941, the six existing district offices of the U. S. Public Health Service were reorganized, bringing the total number

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of districts to eight. On April 1, 1942, District 9 was officially established. This redistribution of States among nine districts was accomplished in the interest of greater economy and efficiency.

Each district office is under the direction of a medical officer, assisted by a staff consisting of junior medical officers, sanitary engineers, a public health nurse consultant, a field auditor, and the necessary clerical personnel. The district office upon request from the States furnishes consultation service on problems pertaining to public health and on matters arising out of the administration of funds under title VI and the Venereal Disease Control Act. During the fiscal year 1941–42, the district offices continued to effect a closer and more personal contact between the U. S. Public Health Service and the States.

In addition to consultation on general administrative problems in public health, the district offices offered consultative service in venereal disease control, public health nursing, and the several aspects of sanitary engineering. The field auditor, in addition to checking the accounts of the several States in his district, served as a consultant in fiscal and accounting practices.

The specialized services furnished during the past fiscal year included consultation in (1) industrial hygiene, (2) dental hygiene, (3) nutrition, (4) malaria control, (5) pneumonia control, (6) cancer control, (7) tuberculosis control, (8) public health education, (9) evaluation of health facilities, (10) recording of health work, (11) shellfish sanitation, (12) milk sanitation, (13) laboratory methods. These services were furnished with the assistance of the central office and other divisions of the Public Health Service, particularly the National Institute of Health.

The provisions of the Lanham Act greatly increased the work in nearly every district. In District 1, for example, surveys and resurveys were made in 85 cities in connection with applications for increasing hospital facilities of communities. Forty-two surveys and supplementary surveys were made in extra-military or industrial areas, and over 100 war public works were covered. District 3 reported progress in the establishment of local health services in critical defense areas. At the instigation of the District Office, the Illinois State Department of Public Health invited the American Public Health Association to make a complete resurvey of its central administration. As a result, a campaign was launched to establish bona fide county health departments under the provisions of emergency legislation. In District 5 more consultation service has been given to State agencies and less to local health departments. Much of the work in Oregon and Washington suffered from lack of a director of local health. In acute war communities local health departments were strengthened, and the survey of the California Department of Public Health was completed.

Venereal Disease Control

In all districts there has been a concerted effort to encourage and stimulate States and the larger cities to greater activity in venereal disease control. Cooperation has been constantly encouraged and urged between military and civilian health authorities wherever possible. Loss of personnel trained in venereal disease control to the military services was keenly felt.

In North Carolina definite progress has been made in maneuver extra-cantonment areas, especially at Fort Bragg, where epidemiolgic and treatment facilities have been improved. In West Virginia several counties showed definite improvement in their programs. A full-time venereal disease control officer has been assigned to the District of Columbia after a long vacancy.

District 3 reports "where bona fide local health departments are functioning, the attack on the venereal diseases is far more effective, per dollar spent, than is the case where special services are installed in the absence of basic health organizations."

In District 4 the venereal disease control program was expanded in all States. Early in 1941 an officer was assigned to and has been actively engaged in maneuver areas of Louisiana, and assisted in the work in South Carolina and Tennessee. During the maneuver period, temporary quarantine facilities for infected prostitutes were in operation in South Carolina, Tennessee, and Louisiana. Lack of funds caused their discontinuance at the end of maneuvers, but strenuous efforts were made to secure the establishment of similar permanent detention facilities for infected prostitutes in all States. A temporary isolation hospital was established at Leesville, La., on April 1, 1942, and has been in operation ever since. Funds for operation of this institution were made available under the Lanham Act. An effort was made toward the close of the year to secure abandoned Civilian Conservation Corps camps, or camps about to be abandoned, for use as detention hospitals.

Toward the close of the fiscal year, the May Act was invoked in 27 counties in Tennessee, adjoining Camp Forrest. In Florida, where serologic surveys on selectees revealed the highest incidence of syphilis in the Nation, the Public Health Service rendered very active assistance to secure reduction of the rate in that State. Ten medical officers have been assigned to Florida and are engaged in venereal disease control work exclusively.

The appointment of a full-time venereal disease control officer in Hawaii, coupled with military control orders and close liaison with military authorities, has resulted in a marked expansion in follow-up of contacts, in bringing infectious cases to treatment, and in holding them under treatment.

In Puerto Rico, the venereal disease control problem became serious. The district office continued to cooperate with the Army, Navy, and Insular Health Department in an effort to ameliorate conditions. In the latter part of June 1942, a hospital for prostitutes was opened in Caguas. At Aguadilla, a hospital for 30 prostitutes was opened during the year; it has operated to capacity and showed excellent results from rehabilitation work with young prostitutes.

The location of large numbers of military establishments and war industries in Texas and New Mexico increased the venereal disease problem in that area. Existing facilities have been reorganized and new ones established. In 1942, 26 additional venereal disease clinics were established, 12 in Texas and 14 in New Mexico.

Industrial Hygiene

War industrial development has lent impetus to the expansion of industrial hygiene activities in most of the districts. A tour of the

States in District 1 was made in the interests of the industrial hygiene activities of the various health departments. In New Jersey, the unit set up by the Public Health Service at the beginning of the fiscal year has carried on a satisfactory program. A good deal of effort has been exerted by the district office to make the work of this unit a permanent part of the State health department. Late in the year, a chest X-ray unit was assigned by the Service to the New Jersey State Health Department to make micro-film X-rays of war workers. Personnel have been provided to New Jersey, New Hampshire, Massachusetts, and Connecticut industrial health units through emergency health and sanitation funds. In District 2 an industrial hygiene program has been organized in four of the States and an industrial hygiene engineer has been assigned to duty in the remaining States. Efforts have been made to strengthen the industrial hygiene program in District 3 and, for that purpose, personnel have been loaned to Kentucky and Michigan. In District 4 every effort has been directed to the establishment of an industrial hygiene unit in the Higgins shipbuilding yards which are to be located near New Orleans. Many of the activities of the district office in Alabama were centered about the industrial expansion in the Talladega and Mobile areas.

Medical Aspects of Japanese Evacuation From the West Coast

The medical service required in connection with the movement of Japanese from the central area to assembly and relocation centers taxed the facilities of the fifth district office. The movement began shortly after March 1, 1942, and was conducted by the Wartime Civil Control Administration, operating under the direction of the Commanding General, Western Defense Command, and the Fourth Army. The medical aspects of the evacuation program were assigned to the Public Health Service. The Assistant Surgeon General in charge of Sanitary Reports and Statistics and the district director were in charge. The cooperation of State and local health departments was enlisted, and the professional staffs of local organizations were supplemented where necessary by the employment of physicians and nurses on a per diem basis.

Prior to induction into an assembly or reception center, every evacuee was examined for the presence of communicable disease or other condition that might endanger him or those whom he would contact. Evacuees who for reasons of health could not travel were visited at either their homes, or in hospitals and, where indicated, were certified for exemption from evacuation. The district office was repsonsible for the hospitalization of certain evacuees.

Wherever possible, infirmaries and hospitals at the evacuation centers were staffed by Japanese physicians, dentists, and nurses selected by the Public Health Service. Japanese physicians numbered approximately 1 to every 2,000 evacuees; the supply of nurses was less adequate, while dentists were numerous.

The scarcity of medical and dental supplies presented difficulties. Hospitals at the centers were equipped by the Public Health Service through the Office of Emergency Management from supplies available in the Los Angeles market. Supplies for the remaining 12 infirmaries were ordered through the Fourth Army. Actual shortages delayed many of the supplies. No dental equipment was furnished, but many Japanese dentists brought their own, and counties

loaned some of their school equipment to the centers. On the whole, the dental service has been inadequate.

Sanitary conditions at first left much to be desired. Removal of evacuees to permanent centers should end the more or less constant danger from outbreaks of epidemic disease. All evacuees were vaccinated against smallpox, with 65 to 70 percent of vaccinia reactions. Antityphoid injections were begun, followed by diphtheria toxoid in all susceptibles under 12 years of age, and pertussis vaccine in all susceptibles under 3 years was being administered at the end of the fiscal year.

As of June 30, 1942, evacuees numbering 97,964 passed through 99 civil control stations to assembly reception centers. The evacuation could not have been accomplished without the help of the health officials of California who not only efficiently performed the duties which are ordinarily delegated to their offices but also rendered many services far afield from ordinary public health work. Each control station was covered by a Public Health Service physician and nurse, as well as each railway or bus convoy movement. Regular and reserve officers were called on in emergencies.

No common epidemic diseases other than measles, whooping cough, and chicken pox have been reported. Several outbreaks of acute food poisoning occurred, due either to inadequately refrigerated food or inadequate sterilization of eating utensils, or both.

War Emergency in Hawaii

Because of Hawaii's distance from the mainland and possible disruption of shipping and because of its military and strategic location, the need for expansion of routine functions and preparation for emergency was recognized early. Plans were formulated with these and other factors in mind. The Insular Health Department secured a 6-months' supply of biologic products and certain drugs for emergency use, as well as laboratory supplies and equipment. Measures were taken for the protection of water supplies and sewage, especially in Oahu. Public health nurse force was given first aid instruction.

Within 1 hour after the first bomb fell on Hawaii, executive heads of the health department met in conference and plans were made for needed services. An inventory of biologic supplies was taken and pharmaceutical houses of the city were also inventoried. All members of the Oahu Health Department were placed on 24-hour call, and for 2 weeks after the attack the office of the board of health was on call day and night. Liaison was maintained with the medical departments of the Army and Navy and other medical officers in charge. All physicians were asked to report communicable diseases by telephone at once. All cases suspected of rising out of contaminated food, milk or water were reported immediately. An immunization station was opened in the office of the board of health for inoculation against typhoid fever and vaccination against smallpox. Restaurant and general sanitary inspection services were intensified.

A large number of civilians and military dependents were evacuated to sections of the island away from points of attack. Assistance was rendered by the nursing service in the health supervision of evacuee centers. Some nurses reported for duty to first aid stations and hospitals for emergency nursing services; still others supervised the setting up of first aid stations and the obtaining of supplies. Public health

nurses were placed on call for bedside nursing care of patients evacuated from hospitals to homes. Private physicians were urged to make use of public health nurses when private ones were not available. In a few instances, public health nurses rendered obstetrical services. The Bureau of Mental Hygiene gave general treatment to individual cases who had been on civilian defense duty too long without rest.

Chief Clerk's Office

Buildings and office quarters.—Following a Presidential order, on February 1, 1942, the Administration Building, at Nineteenth and Constitution Avenue, Washington, D. C., was turned over to the United Nations Chiefs of Staffs for use during the war. The Public Health Service temporarily occupied a group of six buildings which formed part of the old Naval Hospital. The transfer to the new temporary building at Bethesda, Md., took place at the end of May. The Public Health Service also occupies the Blaine Building at 2000 Massachusetts Avenue and space at 1909 Massachusetts Avenue.

Printing and binding.—The total printing appropriation of the Public Health Service for the fiscal year 1942 amounted to $130,790. This appropriation included transfer of funds from the following appropriations: Diseases and sanitation, $19,250; venereal diseases $32,000; and the National Cancer Institute, $10,000. The following sums were also spent: From the appropriation for Emergency Health and Sanitation, $27,670; Emergency Fund for the President, $149; Public Health Service (National Defense), $2,533.

Efficiency ratings.—The Civil Service Commission instituted a new method for making efficiency ratings for the rating year ending March 31, 1942; the system was used for both departmental and field of employees of the Public Helath Service. The rating work was done under the supervision of the Public Health Service Efficiency Rating Committee which prepared instructions to departmental and field officials, made decisions concerning the administration of the system, and considered and approved the individual ratings. Appeals from the ratings have been comparatively few.

Supplies and equipment.—The sum of $54,385 was spent for stationery supplies for headquarters and the field service. A total of 1,324 orders was placed for supplies, equipment, and services, amounting to $513,000.

Mail and records.—The number of pieces of incoming and outgoing mail and telegrams totaled 1,273,805 and the quantity of correspondence classified, recorded, and filed totaled 964,331 during the fiscal year 1942.

Division of Foreign and Insular Quarantine and Immigration

Assistant Surgeon General M. C. GUTHRIE in charge

Not since World War I has the national quarantine function been administered under so many adverse conditions as during the past year. Numerous perplexing problems have arisen, some of which were difficult to solve and frequently resulted in temporary modifications of quarantine practices and procedures.

Prior to the entry of the United States into the war, the arrival at ports on the Atlantic coast of poorly sanitated ships crowded to capacity with refugees from infected areas caused grave concern and placed a heavy burden upon quarantine and immigration personnel. In the absence of legal authority for the detention of persons suspected of being in the incubation stages of dangerous communicable, but nonquarantinable diseases, the institution of a system of surveillance of arriving passengers seemed to offer the best solution. The health official having jurisdiction over the place in the United States or elsewhere to which each passenger suspected of infection was destined, was accordingly notified promptly of the potential danger. Although isolated cases of typhoid fever were reported as occurring among such refugees, no epidemics of disease resulted.

Greater responsibility was placed on quarantine officers by the failure of cargo vessels to comply with the statutory requirement for securing American consular bills of health at ports of departure and call. Numerous violations of this character occurred. The attention of officials in charge of foreign shipping was invited to the fact that not only are bills of health required by law, but that the information which they convey is more essential at this time of national emergency than ever before, because the almost complete breakdown in the international exchange of sanitary information has made it exceedingly difficult for quarantine officers to secure from any other source reliable information regarding the sanitary status of foreign ports and surrounding territory. It is decidedly in the interest of the vessels concerned to comply with the bill-of-health requirements so that less time may be consumed in the quarantine treatment.

The convoy system of handling vessels resulted in great fleets of ships converging upon quarantine stations at the same time for quarantine and sanitary inspection. In many cases it was difficult to handle these peak loads expeditiously with available personnel, and night boarding had to be resorted to in order to facilitate the entry of vessels. Twenty-four-hour quarantine boarding service was instituted at the port of Philadelphia, Pa., in February 1942. Applications for an extension of boarding hours at several other ports were not approved because of the limited personnel on duty and the lack of funds for the procurement of additional employees. Insofar as practicable, however, modifications of normal quarantine procedures were authorized, in order to permit the prompt handling of vessels carrying essential cargoes.

During the year a large number of commercial ships of the United Nations which had visited foreign ports since undergoing inspection

at United States quarantine stations were ordered into United States ports for military reasons. It was evidently the intention of the military authorities that these vessels would retain their in-transit status and consequently would not be required to enter customs or undergo quarantine inspection. A great many instances arose, however, in which vessels remained in port longer than 24 hours and contacted the shore for purposes other than taking on essential supplies. To safeguard the health of the ports involved, quarantine officers were required to inspect carefully each vessel coming within the latter-mentioned class.

Many vessels arriving at United States ports were found to be heavily infested with rats in spite of the fact that they produced so-called "valid" foreign certificates of deratization or deratization exemption. Such infestation was a natural result of lowered fumigation standards at foreign ports and the resultant rapid deterioration of the sanitary condition of ships. Although the United States quarantine authorities desired to cooperate in expediting the movements of these vessels, the effective administration of the quarantine function under the circumstances demanded that, if the vessels had arrived from plague-infected or suspected areas, they be inspected without regard to the presumed validity of the foreign certificates presented, and that they be fumigated whenever infestation so warranted.

The prohibition placed upon the use of ships' radios after the United States had declared war necessitated abandoning the practice of extending radio pratique—a procedure which, after 5 years' trial, had fully demonstrated its practicability and success.

Medical relief or custodial care was rendered at most of the larger quarantine stations to persons injured or otherwise in need of assistance as a result of the action of enemy submarines.

The extension of airplane traffic to all parts of the world increased the danger of the introduction into the United States of exotic insect vectors of disease and required much additional quarantine service of the most expert type at airports of entry in this country. Efforts were directed especially at preventing the introduction of *Aedes aegypti* mosquitoes from areas in which yellow fever was endemic or epidemic, and at excluding the *Anopheles gambiae*, a native of Africa and a highly efficient carrier of malaria.

At outlying United States military bases where there were no officers of the Public Health Service on duty, Naval medical officers were given appointments as Acting Assistant Surgeons in the United States Public Health Service, without additional compensation, for the purpose of signing bills of health, granting pratique to naval vessels and aircraft, and acting as sanitary officers.

Permission was granted to the Navy Department to occupy certain facilities at the quarantine stations at Reedy Island, Del., Sabine Pass, Tex., and San Diego, Calif., and the War Department was permitted to use a portion of the quarantine reservation at Miami Beach, Fla. Space at several of the quarantine stations on the Mexican border was made available to the Army for use as prophylactic stations for the treatment of soldiers returning from Mexico.

The quarantine stations at Knappton, Wash., and Portland, Maine, were transferred, respectively, to the Treasury Department, for use of the United States Coast Guard, and to the Navy Department. On

December 8, 1941, following the Japanese attack on Pearl Harbor, the entire quarantine station at Honolulu, T. H., was turned over to the War Department for use as a detention camp for enemy aliens. The new quarantine station constructed by the Navy Department at San Juan, P. R., was officially turned over to the Public Health Service on January 5, 1942, and the old station on Miraflores Island was released to the Navy Department on the same date.

The Office of Ship Ratproofiing completed its first full year of operation from headquarters at the New York Quarantine Station. An enormous increase in the amount of shipbuilding not only on the Atlantic, Pacific, and Gulf Coasts, but also on rivers and the Great Lakes, resulted in an unprecedented demand for the services of personnel to supervise the ratproof and sanitary construction of new ships. Since funds were not available for the employment of additional personnel, a number of the sanitary inspectors already in the Service were trained in the technique of ship ratproofing and assigned to full or part-time duty in connection with ratproofing inspections. During July 1941, the total number of ratproofing inspections was 49, while in July 1942, 124 such inspections were made.

It is strongly recommended that the protection of the public health afforded by the foreign quarantine mechanism should not be relaxed in any manner. Large areas of the United States are vulnerable to the invasion of many exotic diseases. Failure of the Federal Quarantine Service to exclude these diseases would impose insupportable burdens upon local and State health organizations, especially at a time when all our energy and material resources should be devoted to the country's war efforts.

Statistical information of quarantine and immigration activities during the year appears in Appendix C, tables 6 and 8.

An international certificate of vaccination which had been adopted by the Pan American Sanitary Bureau was approved by the Surgeon General on December 24, 1941, for use by the Public Health Service. On March 12, 1942, the regulations governing the medical examination of aliens, revised August 1930, were further amended by eliminating "syphilis in the noncommunicable stage" from the list of diseases certifiable as class A conditions under the provisions of section 3 of the act of February 5, 1917, and by substituting therefor "syphilis in the communicable stage."

There was a marked decline in the number of importations of birds of the parrot family into the United States. The destruction of the remaining parrots in a shipment of 100 which arrived at the Brownsville, Tex., Quarantine Station was ordered after 50 of the birds had died, and psittacosis infection had been discovered in several of the specimens. On August 15, 1941, the Dominion of Canada, by Ministerial order, prohibited the importation into that country of all birds of the parrot family except privately owned birds. The Florida State Legislature also enacted a law prohibiting the entry of psittacine birds into that State under certain conditions.

The division cooperated with the military authorities to the greatest possible extent consistent with safeguarding the public health. Vessels of the United States Army and Navy which carried medical officers of their respective services, and vessels of the United States Coast Guard which carried medical officers of the Public Health Service,

upon entering United States ports from foreign ports or from ports in the possessions or dependencies of the United States, were exempted from quarantine inspection provided such vessels had not sailed from a port infected with cholera, yellow fever or plague, or in which typhus or smallpox was epidemic, and further provided that no cases of these quarantinable diseases had occurred on board en route. The commanding officer of a vessel coming within the above provisions was required, immediately after the arrival of his vessel, to address a letter to the quarantine officer reporting pertinent facts and inclosing a statement by the ship's medical officer to the effect that no cases of the quarantinable diseases had occurred on board during the voyage. Vessels unable to present the necessary certificates were required to undergo quarantine inspection.

Anopheles gambiae has not appeared as yet in the United States but was responsible for a widespread and devastating malaria epidemic in Brazil in 1940. All commercial aircraft arriving at United States airports located south of 40° north latitude from points on the South American mainland lying north of 30° south latitude or from any point on the African continent were required to be disinsectized, without preliminary inspection, immediately after the disembarkation of passengers and crew and before baggage, merchandise and mail were discharged. Planes arriving from areas in which yellow fever was epidemic, and planes coming nonstop from Africa or from any other foreign area designated by the Surgeon General as dangerous because of the presence of exotic insect vectors of disease, were required to be disinsectized prior to the discharge of passengers and cargo. Operators of commercial aircraft were encouraged to continue the practice of spraying aircraft in flight to safeguard passengers and flight personnel on board.

The Surgeon General was given discretionary authority, when requested by competent military officials, to designate the senior medical officer of an Army or Naval airbase as quarantine officer for the inspection and treatment of military aircraft carrying only military personnel and proceeding on confidential missions.

At the Miami Quarantine Station, a standard procedure for the disinsectization of aircraft was developed. The new procedure has reduced to a marked degree the exposure time required to kill mosquitoes and has relieved both military and commercial aircraft of much of the delay incident to the disinsectization procedure previously followed.

The joint regulations for the application to civil air navigation of the laws and regulations relating to customs, public health, entry and clearance, and immigration were signed on August 28, 1941, by the representatives of the Federal agencies concerned and became effective January 1, 1942.

Division of Marine Hospitals and Relief

Assistant Surgeon General W. F. OSSENFORT in charge

Increased activities associated with and resulting from the development of the national defense program of the previous year carried over into 1942 at an accelerated pace. With the outbreak of war, this division, like others, was soon confronted with the necessity of meeting many new demands and of expanding routine activities.

The total number of physical examinations, not related to treatment, given during the year to all classes of beneficiaries was 299,123, an increase of 27.3 percent over 1941. A total of 752,994 patients was furnished hospital and office care as compared to 547,178 in 1941. Reports indicated that patients admitted during the year required more medical attention and nursing care.

The policy of appointing examiners on a fee basis as special acting assistant surgeons for the purpose of conducting examinations of applicants for enlistment in the Coast Guard has been continued and the number of such examiners greatly increased. In spite of this, the number of applicants appearing at marine hospitals and out-patient offices for physical examinations has taxed the facilities and in some instances required the assignment of additional officers.

There has been a decrease in the number of patients referred by the National Youth Administration, Civilian Conservation Corps, and the Work Projects Administration owing to the curtailment of these activities, while the number of patients from the United States Coast Guard and from vessels of the Army Transport Service and the Army Engineer Corps increased. Coast Guard patients treated in marine and contract hospitals increased from 7,082 in 1941 to 16,167 in 1942. This increase was not proportional to the over-all increase in Coast Guard strength. Further increase in hospitalization is expected from this group of beneficiaries. Surprisingly, patients from the American Merchant Marine treated in hospitals decreased from 29,038 in 1941 to 28,845 in 1942. The total number of patients of all classes given hospital treatment during the fiscal year was 86,986.

The volume of work at the marine hospital at Fort Stanton, N. Mex., was greater than in the previous year. The 1942 daily patient average was 18.2 as compared to 155.9 in 1941. The maximum daily census for the year was 272. The increase was accounted for, in part by the transfer of patients from other hospitals.

A neurophychiatric service has been developed at the United States Marine Hospital, Ellis Island, N. Y. This service, organized and staffed by competent psychiatrists and neurologists, has proved invaluable. Patients suffering from mental or neurologic conditions have been received from other marine hospitals, and the treatment offered compared favorably with that afforded by the best institutions.

A new building, with hospital facilities, was constructed during the year to house the quarantine and relief activities at San Juan, P. R. The structure was completed at the close of the year, but the furnishing of the building was delayed by difficulties in purchase and delivery of supplies and equipment.

The Emergency Medical Relief units have continued to provide first aid treatment to Government employees within the District of Colum-

bia. At the end of the year, there were 17 such units, of which 13 were serving the Treasury Department, and 4 were serving the Reconstruction Finance Corporation, United States Department of Labor, the War Production Board, and the Office of Government Reports. Three new units were organized during the year, and two (Farm Credit Administration and Securities and Exchange Commission) were discontinued. During the year, 163,331 treatments were given to approximately 39,048 eligible employees.

At some of the marine hospitals, it is becoming more and more difficult to provide suitable accommodations for the increasing number of women and children applying for admission. Owing to the changing type and conditions of employment, quite a few women are being employed on American and foreign vessels, especially Russian. Many women who seek treatment are dependents of Coast Guard and Coast and Geodetic Survey personnel, as well as veterans and beneficiaries of the Employees' Compensation Commission. Of the latter group many are received from arsenals and other Government plants engaged in activities of a hazardous nature. At most of the marine hospitals, increased facilities for women and children can be provided only by structural changes.

It has been increasingly difficult to obtain and retain hospital personnel, especially those in the lower-paid grades. It is, of course, impossible to compete with the higher wages paid to workers in war industries. Even many of the older employees have found it necessary, in the face of the rising cost of living, to accept employment in such industries and elsewhere. The loss of attendant personnel has been especially heavy and some marine hospitals are replacing male with female workers. The staff of attendants at one of the larger hospitals included at the beginning of the year 73 men and 11 women; at the close of the year there were 31 men and 52 women. Another hospital reported 28 men and 24 women performing ward-orderly duties at the end of the year. It has become increasingly difficult to find additional female attendants, since many women of the higher grade are accepting more remunerative positions elsewhere. Female attendants, after brief periods of instruction and training, have in most cases functioned quite satisfactorily.

The Bureau of the Budget developed, at the direction of the President, a statement of general policy for the Federal Government in providing nonhousekeeping quarters, subsistence, and laundry services to civilian hospital and other institutional employees. This policy was approved by the President July 11, 1941, and certain marine hospital employees, who are maintaining homes for themselves and one or more dependents in the vicinity of the hospital, have been permitted to receive commutation to cash of quarters, subsistence, and laundry allowances. This policy afforded relief to the personnel affected thereby. Further relief has been attempted by reclassifying, as promptly as funds permit, those positions in which this action is warranted.

Medical officers in charge have been required to take appropriate steps to safeguard as far as possible the buildings in their custody as well as their patients. Blackout material has been installed, sand and other fire-fighting equipment conveniently placed, and shelter areas designated. Fully equipped emergency operating rooms have been provided and first-aid teams, including mobile field units, have been formed and trained. Blood banks have been set up at many stations.

The Public Health Service was asked to provide medical, dental, and nursing care in a number of alien detention camps established in various parts of the country by the Bureau of Immigration and Naturalization. The Department of Justice directed that enemy aliens receive treatment comparable in adequacy to that prescribed by the Treaty of Geneva for prisoners of war. This responsibility was assumed under the Economy Act on a reimbursable basis. Doctors and nurses were assigned to camps at Fort Missoula, Mont., Fort Lincoln, Nebr., Santa Fe, N. Mex., Tujunga, Calif., and Kennedy, Tex. General health and sanitary conditions remained excellent in these camps throughout the year, and there was no serious outbreak of disease. An outbreak of trichinosis developed during the past 18 months in a former Civilian Conservation Corps camp at Fort Stanton, N. Mex. It was not possible to trace definitely the source of the infection since samples of the infected meat could not be obtained. Medical care has been extended to aliens detained at Ellis Island, N. Y.

Responsibility was assumed for inaugurating and maintaining, on a reimbursable basis, a medical and sanitary program for the Alaska Highway project of the Public Roads Administration.

The Eagle intensive treatment of syphilis was employed at a number of stations. At one station, 75 patients were so treated without serious complications. At another marine hospital, the 5-day massive intravenous-drip method with mapharsen was used in treating 52 carefully selected patients. The problem of handling the increased number of gonorrheal patients was met at one of the larger stations by the use of typhoid-vaccine therapy, massive-drip technique being employed to induce a prolonged temperature elevation comparable in type and results with that obtained in the hypertherm. This method enables one nurse to handle 5 to 10 patients and so conserves nursing personnel.

Experimental studies in the treatment of leprosy were carried out in the United States Marine Hospital at Carville, La. An extensive course of treatment with diphtheria toxoid was given to 283 patients, some of the patients being kept under observation for over a year. The result of this treatment was disappointing. Chemotherapy with certain of the new sulfonamide drugs also has been tried. These drugs appeared to be of some value in controlling secondary infections. As yet, direct bacteriocidal or bacteriostatic action on Hansen's bacilli has not been demonstrated, but results appeared to warrant further study. A study of pooled-plasma therapy was undertaken during the year. It was felt that, since adults seem to possess relative immunity to leprosy, some useful anti-bodies might be preserved in their pooled plasma. Six patients were given intravenous injections of 250 cc. of plasma twice weekly with definite improvement in some cases.

Large numbers of vaccinations and inoculations have been given at all of the stations. For a time, yellow fever vaccine was made available to anyone requesting it at certain designated stations; later the policy was modified to make vaccine available only to those traveling to, or through, areas where yellow fever is endemic. One station reported that approximately 10 percent of those vaccinated against smallpox have shown a primary reaction. If this experience be taken as an index, the necessity of vaccination among the civilian population at large is indicated.

On June 30, 1942, there were 976 authorized nursing positions, 16 of which were vacant, an increase from 904 in the previous year. Twenty-

three nurses have been assigned to duty at alien detention stations. Nurses specially trained in psychiatry have been assigned to the United States Public Health Service Hospital at Fort Worth, Tex. In Washington, D. C., the great increase in Government workers has necessitated the assignment of additional nurses to the Emergency Medical Relief units.

The increase in the Nursing Service was attended by an unprecedented turn-over in employees and it has become progressively difficult to fill vacancies. During the year, 184 nurses and 9 dietitions resigned. Of the nurses, 99 resigned to be married or to establish a home, 20 returned home because of illness in the family, and 45 resigned to accept employment elsewhere. The remaining 20 resigned for various other reasons. The service of 16 nurses was discontinued during the year; military leave was granted to 12. With the exception of a few appointees who were certified prior to March 17, 1942, all appointments have been on a War Service basis, 116 nurses, 2 dietitians and 1 physiotherapy aide being so designated.

Dental treatment was given to 165,319 beneficiaries of the Service by 77 full-time dental officers and 38 dental interns. Dental officers were assigned to the following new stations: Coast Guard Training Stations at Alameda, Calif., Curtis Bay, Md., Groton Beach, New London, Conn., and Manhattan Beach, N. Y.; the Coast Guard Chelsea Base, Boston, Mass.; the Coast Guard Receiving Unit, Boston, Mass.; Maritime Training Stations at Manhattan Beach, N. Y.; and Port Hueneme, Calif.; and the Maritime Training Ships *Alleghany*, *City of Chattanooga*, *Berkshire*, *Empire State*, and *American Mariner*.

The major items of treatment furnished and a comparison with the preceding year are shown below:

	Fiscal year 1941	*Fiscal year 1942*
Number of patients treated	120,039	165,319
X-rays	42,683	43,564
Prophylactic treatments (hours)	19,029	23,173
Vincent's stomatitic treatments (cases)	1,636	2,340
Pyorrhea treatments (cases)	4,132	4,488
Extract gas	63,847	62,001
Alveolectomies	4,033	4,344
Alloy fillings	47,562	62,350
Gold inlays	1,380	1,478
Porcelain crowns	128	153
Silicate cement fillings	18,840	22,677
Dentures (full and partial)	7,677	8,199
Fracture cases	306	354
Number of treatments (out-patient)	258,829	340,592
Number of treatments (in-patient)	122,328	124,692
Total number of treatments	381,157	465,284

United States Coast Guard

Medical and dental services rendered the Coast Guard increased during the year. This was especially true of physical examinations, the number increasing from 22,220 in 1941 to 93,308 in 1942. The average number of Coast Guard beneficiaries on active duty and retired was 60,945 as compared to 17,202 in 1941. Seventy-five percent of the in-patient relief furnished Coast Guard personnel was afforded in marine hospitals, the remaining 25 percent being distributed through contract and private hospitals, naval hospitals, and sick bays and infirmaries of the Coast Guard.

The dependent members of the families of officers and enlisted men of the Coast Guard received a total of 54,627 office treatments during the fiscal year 1942 as compared to 50,924 in 1941, an increase of 3,703 treatments.

The two motorized dental stations continued to render dental relief to personnel assigned to duty in isolated stations where regular dental facilities are not available.

As of June 1942, the following full-time commissioned medical and dental officers were on duty with the United States Coast Guard (exclusive of Maritime Service):

	Regular		Reserve		Total	
	Medical	Dental	Medical	Dental	Medical	Dental
Ashore	14	11	16	7	30	18
Afloat	20	0	2	0	22	0
Total	34	11	18	7	52	18

Special arrangements had to be made at some of the larger ports whereby medical and surgical supplies and equipment could be obtained for the Coast Guard with the least delay. At Boston, stocks were stored at the Marine Hospital for Coast Guard use and issued locally by requisition. This method was especially helpful in supplying Coast Guard vessels in port for a short time and in need of equipment and supplies. The value of stock shipped from the Public Health Service Supply Depot at Perry Point, Md., for use by the Coast Guard, increased from $36,105.64 in 1941 to $100,356.02 in 1942.

New Construction

A contract, amounting to $2,374,205, for the construction of new buildings and roads and for the extension and remodeling of certain existing buildings was completed at the Carville Marine Hospital during the year. The construction of seven houses for junior officers, new attendants' quarters, and certain farm and dairy buildings is required to complete the rehabilitation program at this station as originally contemplated. Funds which were available for this purpose have been impounded for the duration of the war. New construction during the year included a building to house the relief activities at San Juan, P. R., with facilities for the hospitalization of 20 patients, and a patients' receiving room at the Marine Hospital, San Francisco.

At Norfolk, Va., the laundry building was extended and new equipment installed, the refrigeration plant repaired and certain diet kitchens enlarged. At Galveston, Tex., new rubber tile flooring was installed throughout the hospital building and a fire-alarm and sprinkler system furnished. The station laundry at Louisville was enlarged and the morgue and autopsy room relocated. At Fort Stanton, the sanitary sewer system was reconstructed and a new sewage-disposal plant was erected. About 3 miles of water-supply line which was washed out and seriously damaged in the Bonita River flood was repaired and many buildings extensively rehabilitated. At Freedmen's Hospital, approximately $50,000 was spent for the general rehabilitation of the various buildings.

Supplies and Equipment

The records of the Medical Supply Section for the fiscal year 1942 show that a total of 5,035 requisitions was received. Supplies and equipment amounting to $840,248 were either approved for purchase through the Procurement Division or were bought by this office during the fiscal year 1942; supplies and equipment valued at $392,562.50 were shipped from the Supply Station, Perry Point, Md. Surplus property received from other Government departments during the fiscal year 1942 was valued at approximately $3,496.32.

Division of Mental Hygiene

Assistant Surgeon General LAWRENCE KOLB in charge

The functions of the Division of Mental Hygiene as imposed by law have continued unchanged during the fiscal year 1942.

Studies of the Nature and Treatment of Drug Addiction

At the United States Public Health Service Hospital, Lexington, Ky., a new unit for research was opened, comprising a 12-bed ward with adequate bath, recreation and treatment facilities; a group of sound-shielded and temperature- and humidity-controlled laboratories; a shop; a dark room; an electroencephalograph; laboratories for work in physiology and biochemistry; offices and library.

Investigations were continued of the new synthetic analgetic (1-methyl-4-phenyl-piperidine-4-carbonic acid ethyl ester hydrochloride), known in Europe as dolantin and in the United States as demerol. This drug which has morphinelike action was administered to 5 post-addicts for 2½ months. Upon withdrawal, a definite abstinence syndrome appeared, resembling that of morphine withdrawal except that it was less severe. Three of the patients were returned for further study 6 months after withdrawal, and the drug was readministered in smaller doses and at less frequent intervals. Definite evidence of physical dependence developed within 2 weeks. This suggests that readdiction to demerol may occur with greater facility than an original addiction, as is thought to be true with morphine. Demerol was found to have a pain-threshold-raising effect in post-addicts. Tolerance to this effect occurred with repeated doses. Following prolonged administration of demerol, a toxic psychosis characterized by hallucinations, loss of motor control, and exaggerated tremors was produced in some cases. Electroencephalographic studies and tremorgrams showed abnormal findings which paralleled in intensity and duration the course of this toxic psychosis.

Studies of the fate of heroin in man revealed that both free and bound morphine are excreted in the urine of addicts receiving heroin. The amount of free morphine excreted after substitution of heroin for morphine is only slightly decreased despite the fact that the replacement dose of heroin was but one-fourth to one-half that of morphine. The percentage excretion, however, was usually considerably higher when heroin was given. The amount of bound morphine found in the urine during heroin administration was considerably less than during the administration of morphine; the percentage excretion was somewhat variable but approximated that found during morphine administration.

An improved method of measuring the effects of drugs on the abstinence syndrome was developed. Results indicated that the following substances are ineffective against a morphine abstinence syndrome: Atropine, prostigmin, pento-barbital, thiamine, and normal saline. Piridoxine caused an insignificant reduction in abstinence syndrome intensity. Diethyl-amino methyl-3-phenanthyl carbinol caused a late but significant reduction in abstinence syndrome inten-

sity. Codeine, morphine, demerol, and morphine sulfuric ether caused prompt and significant effects, the extent varying with the dose. Twenty mg. of morphine intravenously had a much greater and more prolonged effect than 20 mg. of morphine subcutaneously.

Further studies indicated that the prostigmin-cholinesterase reaction fails to occur in certain homosexual patients. The response of nonhomosexual post-addicts is greater than that of nonhomosexual nonaddicts. The finding that morphine in amounts of up to 100 mg. does not affect cholinesterase concentration would appear to invalidate the hypothesis that morphine acts in a cholinergic manner in man.

The outstanding characteristic of the addict population of this hospital, as revealed by the Rorschach test, was a large amount of anxiety, constriction, and depression. Only 17 percent of post-addicts were free from any of these features. Morphine in psychologically satisfying amounts reduced these signs. It would thus appear that anxiety and tension are closely related to problems of drug addiction. This contention was supported by the finding that the level of skin resistance is increased by morphine, a change which is associated with a reduction in tension.

Abusive Uses of and the Medicinal and Scientific Needs for Narcotic Drugs

At the request of the Bureau of Narcotics, a representative of the Service was detailed to study a modified type of unit for rationing drugs to addicts at the Cleveland City Hospital, Cleveland, Ohio. After each of the 23 patients had been interviewed and their clinical records had been studied, it was recommended that all but two apply to the United States Public Health Service Hospital, Lexington, Ky., for treatment. The exceptions were two addicts of long standing, 73 and 76 years of age respectively, in poor physical condition, whose lives would be endangered if taken off drugs.

Conferences were held with the Chief of the Drug Section and other representatives of the War Production Board, with medical officers of the Army, Navy, and Public Health Service, and the Commissioner of Narcotics to consider opium supplies in the United States and their conservation. It was the consensus that the stocks of drugs in the country are adequate, but that measures should be taken to insure a continued flow of opium to meet possible increased emergency needs.

Hospitals for Drug Addicts

The drug-addict population at the Lexington, Ky., and Fort Worth, Tex., hospitals has declined considerably since the war started, presumably because addicts were unable to obtain their supplies of illicit drugs. The war has, however, brought an increase in psychotic patients who are beneficiaries of the Federal Government, especially those in the armed forces. To provide additional facilities for their care and to relieve St. Elizabeths Hospital of some of its load, the President issued Executive Order No. 9079, under date of February 26, 1942, authorizing the Public Health Service Hospitals at Lexington and Fort Worth to admit and treat insane persons, except residents of the District of Columbia, upon the same terms and conditions as

such persons may be entitled to admission to St. Elizabeths Hospital. It was decided, for the present at least, to use the Fort Worth hospital primarily for the treatment of psychotic patients and the Lexington hospital for the treatment of narcotic patients. A statistical summary of the movement of patients at the two hospitals during the year is shown in appendix C, table 20.

United States Public Health Service Hospital, Lexington, Ky.

All the new hospital facilities were placed in service during the year; namely the new women's building of 100 beds, and an additional 200-bed unit for male patients. The nurses' home and new officers' quarters were also placed in service. During the year there were 283 admissions to the new units.

Disciplinary problems in the women's unit have been few in number and have been confined to a very few patients. The same difficulty in holding voluntary patients as has been encountered in the men's units has been met among the women. An educational program is being developed.

The physician in charge of the women's unit and his assistant are trained in psychiatry, so that it has been possible to provide intensive study of the individual and a considerable amount of psychotherapy for the small number of patients.

In March 1942, a new continued-treatment wing was opened, permitting the development of an honor section among nonwhite patients. Later in the year the new east wing was opened, which afforded more satisfactory living quarters for the group of Chinese patients and greatly expanded the more desirable type of living quarters for trusty patients. The section for informers was completed by the addition of stairway grilles enabling the utilization of the upper floors. Thus the section has become virtually a self-contained unit, with a small infirmary and rooms where behavior problems can be isolated. Activities have been developed which enable these patients to be out of doors much of the time and engaged in useful physical work.

The activities of the social service department have been greatly expanded, since the Selective Service registration of the patients was the responsibility of this department. Aid to patients in planning for placement in the community after discharge has been increased, and contacts with probation officers and with civilian social service agencies have been extended. The follow-up process, by which patients come into the institution for interview and for chemical analysis of the urine and of the blood, has been extended. This procedure has been useful in increasing the self-control of the patients and in satisfying society, particularly probation officers, as to the abstinence status of the discharged patients.

Follow-up studies of the results of the treatment of drug-addict patients have been continued. The "questionable" category previously reported has been discontinued. The results of 5,257 cases discharged from January 1936 to June 1941 inclusive were as follows: On 38 percent no report could be obtained; 9 percent were dead; 38 percent had relapsed to the use of drugs; and 15 percent were still abstinent.

The work gang, on which adverse-behavior-problem patients spent a transition period between isolation and return to the general population, was abolished. The practice necessarily gave the impression that work was a punishment instead of an important and interesting

activity. The adverse-behavior-problem patients now stay in the isolation section under the care of a psychiatrist until they are believed prepared to return to the general population. It seems that a greater amount of work is accomplished by the men now than when construction work was used as a disciplinary activity and the morale of the group is very much higher.

The activities conducted under the working capital fund have been valuable in the development and functioning of the rehabilitation and educational programs. Farm activities were impeded by the decrease in the population during the early part of the fiscal year; but with the influx of patients from the hospital at Fort Worth, these activities functioned normally.

The garment shop has afforded opportunity for vocational therapy and has contributed toward the rehabilitation of many patients. At least 90 different types of garments and articles were manufactured during the year at monetary saving to the Government. The woodworking shop was placed in full operation. Some furniture for the new facilities of the institution has been built and a number of orders for the Signal Corps Depot at Avon, Ky., have been filled.

A cost-accounting system for the working-capital activities was developed. It should be of great assistance to the administration of the institution and to the heads of the various working-capital activities in deciding what type of work should be pursued, which activities should be modified and which should be discontinued.

United States Public Health Service Hospital, Fort Worth, Tex.

Since the institution of the plan of granting "super trustyship" to selected patients and quartering them in No. 3 building there has been a reduction in the number of disciplinary reports. Combined with a decreasing number of requests for work changes, this has reduced the work of the Reclassification Board by approximately one-half.

From February 1942 to the close of the fiscal year, a total of 400 psychotic patients was admitted by transfer from St. Elizabeths Hospital in groups of 100; 95 patients were received from the Navy in groups of 50 and 45 respectively; and 8 patients were received from other sources. On June 30, 1942, the patient population comprised 502 psychotic patients and 295 narcotic patients, a total of 200 drug-addict patients having been transferred to the Lexington hospital during the year. The care of the psychotic patients required the employment of 7 additional nurses and 42 attendants. The United States Navy assigned a medical officer and 5 corpsmen to care for the official records required for the Navy patients. The American Red Cross assigned a psychiatric social worker for duty at the hospital.

Medical and Psychiatric Services in Federal Penal and Correctional Institutions

The Public Health Service continued to furnish and supervise the medical, technical, and psychiatric services in Federal penal and correctional institutions under the jurisdiction of the Bureau of Prisons, pursuant to the act of May 15, 1930. At the close of the fiscal year, the Service was operating a total of 26 independent units, providing complete medical service for 27 institutions.

Rehabilitative aspects of the medical program have been stressed. Each newly admitted prisoner was given a complete physical and psychobiological examination, the results of which were recorded on diagnostic cards filed in such fashion that all remediable diseases and conditions remain in a "pending" position until corrected. If the patient was backward about accepting such measures, the medical staff assumed the initiative in calling him at periodic intervals to discuss the advantages that might accrue from the procedures advised.

Although the total prison population decreased by approximately 1,000, there was a sharp increase in the proportion of inmates with physical and mental disabilities.

The blood type of every newly admitted inmate was determined at most institutions at the time that blood for serologic tests was taken. All other inmates and employees who volunteered as donors were likewise typed. A gratifying percentage of inmates volunteered to contribute blood to wet-and-dry banks for use in either the local community or by the armed forces. At some institutions, Red Cross units made regular weekly calls for from 50 to 75 pints of blood.

The war almost completely disorganized the technical-assistant corps. The medical-technical position was established in 1939 and the specifications are based on the training received by chief pharmacists mates in the Navy or master sergeants (Hospital Corps) in the Army. This corps came to fill an irreplaceable position in the prison medical service where paid staffs are numerically small, where inmates do much of the actual work, and where a great deal of teaching and supervision devolves on the civilian staff.

The close of the fiscal year found an unceasing stream of medical officers, medical technical assistants, and guard attendants from the prison medical service into the armed forces. Their replacement by equally well-trained new employees was impossible.

At Springfield, discontent among the attendant group because of the low salary level, compared with positions elsewhere, enlistments, and induction into the armed forces, combined to bring about the astonishingly high turn-over of approximately 33 percent.

The activities of the medical service are shown in Appendix C, table 21. The increase in the proportions of mental cases can be charged, in part at least, to the operation of the Selective Service Act, violations of which brought into conflict with the law many individuals who, while frankly psychotic, had been adjusting at their social level and hitherto had not required hospitalization. The unbalance of the usual ratio was reflected in the admission of patients to the Medical Center at Springfield, Mo., where the proportion of bedfast patients received was much greater than in any previous year and where, despite the decrease in the total Federal prison population, there existed a waiting list for all types of patients during almost the entire year.

The approval on June 29, 1941, of an act to eliminate the prohibition against enlistment into military service of any person convicted of a felony was an event of rehabilitative importance in the Federal prison system. Many cases believed to be suitable for induction were reviewed in order that the men might be considered for Selective Service at the time of their discharge by parole or conditional release.

Progress has been made in the development of a more uniform psychometric program. The Public Health Service Group Classifi-

cation Psychometric test has been given in all institutions employing psychologists.

Several institutions continued to participate in the provision of psychiatric service to Federal courts. Several prisoners who were on trial or awaiting sentence were admitted for psychiatric examination at the request of the courts concerned. The correctional institutions at Texarkana, Tex., and Denver, Colo., and the detention headquarters at New Orleans, La., and New York, N. Y., were especially active in this field.

The research projects during the year included the studies being conducted in the psychopathic units at the Medical Center, the reformatories at Chillicothe and El Reno, the correctional institution at Englewood, Colo., and the penitentiary at Lewisburg, Pa. The Medical Center reported on several phases of the studies, such as (1) traits and clinical features, (2) psychometric and psychological studies, (3) homosexuality, (4) electroencephalographic studies, and (5) disciplinary and administrative methods. Plans were completed to undertake certain biochemical studies which are to be closely correlated with the clinical and psychological investigations.

Division of Personnel and Accounts

Assistant Surgeon General PAUL M. STEWART in charge

The Personnel and Accounts Division supervises all operations of the Service relating to personnel, finances, and the maintenance of property records. 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. Appendix B, table 2, contains a statistical summary of the number of commissioned officers, active reserve officers, and other medical and allied personnel for the fiscal year 1942.

The scientific staff of the National Institute of Health comprised 382 members, of whom 125 were commissioned officers and 257 other professional workers. The staff was assisted by 443 technicians and 408 other subordinates, making a total of 1,233. In addition, 163 persons held appointments as consultants.

The Property Return Section accounted for all property of the Service and 329 property returns were audited during the year. A total of $4,900 was turned in to "Miscellaneous Receipts" from sales of property.

Property surplus to the Public Health Service valued at $6,393.44 was transferred to other Government departments. Surplus property of other Government departments valued at $44,709 and 29,089 pounds of sugar, valued at $1,454.45 was taken over by the Public Health Service.

Property valued at $52,382.55 was transferred from Service stations where it was surplus to other stations where it could be used.

The Accounts Section of the Division of Personnel and Accounts conducts all bookkeeping and accounting in connection with the expenditure of Public Health Service appropriations. This includes also accounts of miscellaneous collections, allotments, records of encumbrances, cost accounting, and the administrative audit. The tabular statements of these activities are shown in Appendix A.

Of the 17,053 employees of the Public Health Service, as of March 31, 1943, 5,152 listed as collaborating epidemiologists and assistant collaborating epidemiologists receive only nominal compensation. These employees are health officers or employees of State or local boards of health, who furnish the Service with reports of communicable diseases received by State or local health organizations. The personnel statement also includes all part-time employees, those employed on a per diem basis or on a fee basis.

Division of Sanitary Reports and Statistics

Assistant Surgeon General E. R. COFFEY in charge

The Division continued its functions of collecting and publishing morbidity and mortality reports, editing certain publications of the Service, and disseminating health information. The programs for the production and distribution of educational materials and for organized Negro health education were expanded as a result of steadily increasing demands for services of these types.

Statistical Reports

Morbidity and Mortality in the United States

Reports from State and city health departments for the calendar year 1941 indicate that the incidence of most of the common communicable diseases was below the median prevalence for the preceding 5 years. In 1941, new low figures were reported for smallpox, scarlet fever, and typhoid fever. The 1941 incidence of diphtheria and meningococcus meningitis was below the 5-year median.

Epidemics of influenza and measles occurred in 1941. The influenza outbreak started in November 1940 in California and Arizona and spread rapidly eastward across the southern part of the country. The peak was reached about the middle of January 1941. The cases were generally mild, but more than twice as many were reported in 1941 as for the 5-year median (1936–40). The outbreak of measles began in November 1940 and spread slowly until January 1941, when it gained momentum rapidly until the peak was reached during the first part of April. The number of cases of measles reported in 1941 was three times higher than either the 5-year median or the 1940 figure. At the peak of the epidemic, March 22 to April 19, the number of cases was the largest on record for corresponding weeks in any year. The outbreak was especially severe in the Middle Atlantic, East North Central, South Atlantic, and East South Central States.

The incidence of poliomyelitis was also above the median in 1941, although the number of cases was 8 percent less than that reported in 1940. The outbreak was confined largely to the Atlantic and East South Central States.

The general death rate in the United States was 10.5 per 1,000 population, the lowest ever recorded. Maternal mortality declined for the twelfth consecutive year, reaching a new low of 3.0 per 1,000 live births. The infant death rate (45 per 1,000 live births) showed no change.

The epidemics of measles and influenza resulted in slightly higher mortality from these causes, but the death rate from pneumonia (a common complication of these diseases) declined sharply from 53.2 per 100,000 in 1940 to 46.6 per 100,000 in 1941. The death rate from cancer increased from 120.3 to 131.2 per 100,000 population, the smallest increase recorded in the past 10 years. The death rate from automobile accidents increased sharply during 1941; the rate, 27.5 per 100,000 population, was 16 percent higher than in 1940. The death rate from other accidents decreased slightly. Mortality from the

following diseases declined for the fifth consecutive year: Diphtheria, digestive diseases, malaria, pellagra, scarlet fever, and tuberculosis.

Beginning January 1, 1942, the system of morbidity reporting was revised. The list of diseases reported weekly by State health officers was increased to 16, by the inclusion of anthrax, dysentery, infectious encephalitis, leprosy, Rocky Mountain spotted fever, tularemia, and typhus fever. Formerly, only diphtheria, influenza, measles, meningococcus meningitis, poliomyelitis, scarlet fever, smallpox, typhoid fever, and whooping cough were reported on a weekly basis. In accordance with recommendations made in 1941 by the Committee on Records and Reports of the State and Provincial Health Authorities of North America, efforts have been made to reduce and simplify the reports requested of the States.

Two additional States, Nebraska and Oklahoma, adopted the system of reporting to the Public Health Service through collaborating epidemiologists, making a total of 44 States and the District of Columbia using the system. Table 10, Appendix C, shows the number of cases of communicable diseases reported in 1941.

Foreign Reports

The expansion of the war zones further curtailed information on the world prevalence of disease. From many countries no official reports were received, while from others only fragmentary reports were available. The figures for most of the quarantinable and other diseases are, therefore, not comparable with those for prior years. The information at hand, however, indicates increases in some of the quarantinable diseases, especially typhus fever, in certain countries and a geographic spread of some of these diseases in certain areas.

The highest incidence of cholera continued to be reported in India and China. Of the 20 or more countries reporting the presence of plague during 1941, the highest incidence occurred in India and Morocco, the Dutch East Indies, and British West Africa. Significant increases were recorded for these countries and also for Brazil and the Union of South Africa. Smallpox was reported in practically all countries of both hemispheres, with the largest number of cases occurring in India.

Even fragmentary reports revealed a considerable increase in the incidence of typhus fever during 1941, especially in Europe and North Africa. A total of 18,827 cases was reported in Algeria, as compared to 2,146 in 1940; and 18,000 cases were reported in Egypt, as compared to 3,636 in 1940. No significant increases were reported in the countries of the Western Hemisphere.

Yellow fever was reported in 16 countries during 1941, principally in Africa, but no extensive epidemics were recorded. In the Western Hemisphere the disease was reported in Brazil, Colombia, Peru, and Venezuela.

Table 11, Appendix C, indicates the areas in which quarantinable diseases occurred during the calendar year 1941.

Study of Laws and Court Decisions

A comparative analysis of State smallpox vaccination laws and regulations was prepared and published in the Public Health Reports. A similar analysis of State laws and regulations relative to immunization against diphtheria was published. A survey was begun of the

various laws and regulations to determine what diseases and conditions are reportable in the several States. State session laws were searched to ascertain legislation of public health interest. Court decisions pertaining to public health were abstracted and published in the Public Health Reports and many requests for information on sanitary legislation and court decisions were answered.

The Public Health Reports

Volume 56, part II, and volume 57, part I, of the Public Health Reports were issued, comprising 52 numbers and containing 2,120 pages of text and tabular matter, as compared to 2,569 pages in the fiscal year 1941 and 2,330 pages in 1940. Indexes were issued for parts I and II of the yearly volumes. Approximately 145 articles were published and reprints of 97 articles were issued during the fiscal year 1942 as compared to 115 during 1941 and 90 during 1940.

Public Health Reports is sent each week to approximately 8,800 individuals and organizations, including 2,109 State and local health department personnel, 848 public libraries, 383 medical libraries, 260 faculty members of medical and dental schools, 455 public health nurses, and 1,029 Public Health Service personnel. Some 580 subscriptions went to foreign countries. One new supplement to Public Health Reports and new editions of 5 reprints and 8 supplements previously published were issued.

Negro Health Work

The Negro Health Work Section maintained its full program of activities in health education. The topic for the National Negro Health Week of 1942 and for the ensuing year-round program was Opportunities in the National Defense Program for Improvement of Community Health.

Organized Negro health programs have been in operation in 6,016 communities in 31 States and Territories. Reports submitted by each of these community organizations indicate that some 5,000,000 people participated in the program. More than 11,000 health lectures were given in connection with these community programs, and the pastors of 6,400 churches devoted sermons to health topics. Motion pictures, exhibits, radio broadcasts, and newspaper articles reached large audiences and some 350,000 pieces of literature were provided for distribution at meetings and exhibits. During Negro Health Week, 138,600 men, women, and children were registered in 2,100 clinics.

In cooperation with the Georgia State Department of Public Health a demonstration in rural health education was conducted at Fort Valley State College, Fort Valley, Ga. The Public Health Service assigned a Negro physician to direct the demonstration. Reports indicate that the Negro college can make a definite contribution to the health of adjacent areas, through organized school and community activities. Prescribed courses in health education were made a part of the school curriculum and general health instruction was made available to community groups.

Forty-four localities in 17 States were visited during the year, and contacts made with 308 national, State, and local organizations. Activities included lectures and conferences, at which 131,155 persons were present, and the showing of motion pictures. A total of 91,500

pieces of health literature was distributed. The chief of the section also participated in the summer conference of the North Carolina School Health Coordinating Service of the North Carolina College for Negroes, and served as liaison for various official and voluntary health agencies and cooperating organizations. The National Negro Health News was distributed to 3,500 persons and the Negro Health Work exhibit was displayed at several meetings and conferences.

Editorial Section

The Editorial Section completed 215 writing assignments during the year, 140 of which, or 65 percent, were undertaken for the use of officials of the Public Health Service, the Federal Security Agency, and other Government agencies. This group included addresses, magazine articles, chapters of books and reference publications, radio talks, official reports, and statements to the public. More than one-half of these manuscripts were 1,000 to 5,000 words in length; about 40 percent were 500 to 1,000 words; and less than 10 percent were under 500 words.

Materials prepared for the press accounted for 20 percent of the articles prepared but none of these materials exceeded 500 words in length. Twenty-three pamphlets, leaflets, and folders for health education of the public were prepared. Included in this group were Nos. 5–9 in the Workers' Health Series, which had been initiated the preceding year. Beginning with the April 1942 issue, the monthly News Letter issued by the Division of Industrial Hygiene, National Institute of Health, was prepared by the section.

The section was responsible for public relations and management of the Conference of Governmental Industrial Hygienists held in Washington, D. C., April 9–11, 1942. Press service, registration and exhibits were provided. Nineteen papers were presented at the conference and summaries of most of these were prepared.

The Editorial Section continued to review, and revise when necessary, manuscripts submitted to the Public Health Service for comment by other agencies and private individuals. Consultation was given to many official and nonofficial agencies on the selection of health education materials.

Editorial services to the press, radio, and magazines increased significantly during the year. This may be accounted for in part by the curtailment of routine press releases; but it would appear that the activities of war agencies and increased public interest in national health as a vital factor in the war effort have been chiefly responsible for the increased demands upon the section. During the year, more than 300 individuals—independent writers, and representatives of Federal agencies, newspapers, press services, radio stations, magazines, publishing houses and advertising agencies—have been assisted in obtaining accurate information on a wide variety of public health and medical problems. These advisory services have resulted in the publication or broadcasting of health information through many private and official channels, including foreign newspapers and magazines and short-wave radio.

Special materials were prepared for the Coordinator of Information, the Coordinator of Inter-American Affairs, the Office of Defense Health and Welfare Services, and for several divisions of the Office of War Information.

Graphics Section

The Graphics Section was responsible for the original design, lay-out, hand lettering, illustration, and production routine for 34 publications during the year.

Twenty posters were produced in 1942. Poster-production includes planning, design, lay-out and finished drawings which require hand lettering, illustrations, and photographs. Two of the posters were "Prostitution Spreads Syphilis and Gonorrhea" and "Know for Sure—Get a Blood Test for Syphilis". Both were accepted by the Art Directors' Club of New York for exhibition in their twenty-first annual show held at the Metropolitan Museum of Art.

Seven new exhibits were planned, designed, and constructed during 1942 and 6 others were designed or remodeled. Exhibits of the Public Health Service were shown at 28 places.

The section completed designs in full color of 5 streetcar and bus display cards for silk screen reproduction by local health departments; and consultant services in the production of graphic materials were given to other official health agencies. More than 300 charts, graphs, maps, statistical figures and miscellaneous drawings were prepared in connection with work of the Public Health Service.

The photographic files acquired some 500 new negatives, bringing the total now available to approximately 8,000. A total of 2,069 prints were furnished. In addition to the requirements of the Public Health Service itself, 350 pictures were sent to other governmental agencies, including the Federal Security Agency and its constituent units, the Office of Defense Health and Welfare Services, the Department of Agriculture, the United States Children's Bureau, the Work Projects Administration, and the Pan American Sanitary Bureau. Approximately 130 prints were furnished to publishing firms for text book illustrations and an additional 420 to magazines, newspapers, and news picture services. Public and private health agencies received 430 prints. Educational institutions were supplied with 90 photographs.

Radio, Motion Picture, and Distribution Section

Eight 15-minute dramatic radio programs, comprising the "Health for America" series, were written in the section and produced. "Shadow on the House," was awarded honorable mention at the Sixth American Exhibition of Recordings of Educational Radio Programs.

Six motion pictures were released during the year. In most frequest demand was "Know For Sure", a 22-minute black-and-white sound film on venereal diseases. It was produced for the Public Health Service by the Research Council of the Academy of Motion Picture Arts and Sciences. The film has been widely used in Army posts, at Naval establishments, and in war factories.

Prints of 13 motion pictures produced by the Public Health Service and 12 health films produced by other agencies were distributed on a loan basis. In an effort to decentralize distribution and cut the time lost in transporting the films, several motion pictures were placed on deposit with State and local health officers, university extension service depositories, and the film libraries of other Government agencies. A number of official and nonofficial health agencies have purchased prints of Public Health Service films for repeated showing in their communities.

During the year, 620,197 publications were distributed without charge. This was a decline of 48,483 publications, or 7 percent, from the previous year. The number of publications sent out on mailing lists declined from 57,450 in 1941 to 52,571 in 1942. These decreases reflect a more careful editing of requests, rather than any appreciable slackening in popular interest in health subjects. More than 1,500,000 Public Health Service publications were sold by the Superintendent of Documents, Government Printing Office.

National Institute of Health

(Division of Scientific Research)

Assistant Surgeon General R. E. DYER, Director

On February 1, 1942, Assistant Surgeon General L. R. Thompson, Director of the National Institute of Health, was ordered to duty in the Office of the Surgeon General, and Senior Surgeon R. E. Dyer, Assistant Director, was appointed Director of the Institute.

The exigencies of the war have demanded greater emphasis on production of vaccines, development of methods for the manufacture and preservation of blood substitutes, synthesis of new drugs for the treatment of malaria and other diseases, and ever-expanding research into matters pertaining to the health of the worker and to medical services for the civilian population.

In February 1942, the library of the Public Health Service was moved to the National Institute of Health and the two libraries have been consolidated. It is estimated that the combined collection consists of 41,431 volumes and approximately 10,000 pamphlets. During the year, 1,981 volumes were added to the library and 601 periodicals were received, of which 289 were paid subscriptions. A total of 20,281 books and periodicals were circulated. Of these, 19,733 were circulated within the National Institute of Health and Public Health Service, and 548 to other libraries and individuals; 3,844 were borrowed from other libraries, making a grand total circulation of 24,125. The number of photostat pages received was 4,435; bibliofilm, 302; and medicofilm, 1,400.

Three Public Health Bulletins and two National Institute of Health Bulletins were prepared for publication during the past year, and an additional bulletin was published by a cooperating agency.

Eighty-five of the 105 papers submitted for *Public Health Reports* were recommended for publication during the year; 313 scientific papers were approved for publication in outside journals or for presentation at society meetings. Twenty-nine manuscripts were reviewed at the request of other divisions of the Public Health Service or outside agencies.

Division of Biologics Control

Surgeon M. V. VELDEE in charge

The amount of biologic products tested and released in order to supply the armed forces has increased markedly. The demand for virtually all biologic products has been greater than ever before. This was particularly true of tetanus toxoid and smallpox, yellow fever, typhus, and cholera vaccines.

Normal human plasma and normal human serum albumin in unprecedented quantities are now required by the armed forces and the civilian population. Methods for the manufacture and preservation of these blood substitutes have had to be developed, and in this work the division has taken an active part.

Arsenical preparations.—The study of the comparative curative value of the arsphenamines and therapeutically related organic arseni-

cals in experimental syphilis indicated that sulfarsphenamine is superior to neoarsphenamine as an antisyphilitic agent and that both products are more effective than arsenoxide. Confirmatory evidence was obtained that *Treponema pallidum* will not survive the freezing and drying process used in the production of dried normal human plasma. The routine submission of licensed arsphenamine products for official testing increased, owing to the development of extensive export trade and to the needs of the Army and Navy.

Bacillary dysentery.—The Shiga type of dysentery bacilli produces a toxin which produces antitoxin when animals are immunized. A method for evaluating the antitoxin content of antidysentery serum has been worked out and all such commercial serums are being checked. It has been recommended that the manufacturers prepare monovalent Shiga antitoxin, since this is the only antidysentery serum which has shown definite therapeutic value.

Cholera.—Freshly isolated strains of *V. cholerae* suitable for vaccine manufacture have been obtained and distributed. It has been demonstrated that lethal infections may be established in mice, and that mice immunized with cholera vaccines resist fatal doses of this organism. The mouse test has also been arranged so as to make a suitable demonstration of the antigenic value of cholera vaccine. It has been observed that sulfonamide drugs favorably affect the outcome of infections in mice given fatal does of *V. cholerae.*

Hemophilus influenzae.—A comparative study of the action of six sulfonamide drugs on type b *Hemophilus influenzae*, *in vivo* and *in vitro*, has been completed. *In vivo*, sulfadiazine was the most active; *in vitro*, sulfadiazine and sulfathiazole were of similar activity; sulfanilamide was relatively inactive; the other drugs were intermediate in action. The results of treatment in mice with a combination of sulfadiazine or sulfapyridine and specific antiserum seemed to be better than the cumulative effect of the two agents administered in separate doses.

Meningococcus.—A mouse protection test for the evaluation of therapeutic serums has been adopted officially and minimum requirements for antimeningococcus serums have been sent to all licensed manufacturers. Minimum requirements for meningococcus typing serum have also been adopted. Study of the type distribution of meningococci in this country has been continued.

Pneumococcus.—Studies have been made on all available unclassified strains of pneumococci and on types classified in other laboratories, and a review of the literature has been made to determine the incidence of, and mortality rates from, the different recognized types. In collaboration with the New York City Laboratories, these data are being used to classify new types and to reclassify certain types described by different laboratories under the same numbers, or the same types which have been described under different numbers. A regrouping of the typing serum mixtures is being formulated. Standard control serums for comparative mouse protection tests have been distributed for types I, II, V, VII, and VIII. Therapeutic serums for the other types have been released on the basis of mouse protection tests or antibody nitrogen content. There has been a reduction by about 30 percent in the number of lots of therapeutic serums released in 1942 as compared to the number released in 1941.

Tetanus.—Studies are in progress on the production of tetanus toxoid in a protein-free medium. Experimentally, toxoid produced in casein hydrolysate media has shown variable immunizing properties in guinea pigs although parent toxins have shown high potencies. Studies are in progress on the action of formaldehyde on tetanus toxin; methods for measuring the combining properties of tetanus toxoid; and on the production of a tetanus-perfringens toxoid.

Miscellaneous.—Work on a guinea pig skin test for the determination of the potency of tuberculin preparations in relation to a standard purified protein derivative of tuberculin is in progress.

At the close of the fiscal year 72 establishments, 15 of which were foreign, held licenses to engage in interstate sale of biologic products. The licenses covered 178 products. These substances are used in various combinations so that actually the number of licensed products offered in interstate commerce is many times greater.

Division of Chemistry

Professor CLAUDE S. HUDSON in charge

Sugar researches.—Fundamental studies relating to the structure and configurations of the carbohydrates were continued. They include a continuation of the researches on anhydro sugars. The alkaline detosylation of 4-tosyl-D-mannosan (1.5) β(1,6) has been shown to proceed with Walden inversion and *cis* ethylene oxide ring formation to yield an anhydro derivative which is presumably 3,4-anhydro-D-talosan (1,5)β(1,6). A study was made of the periodate oxidation of D-galactosan (1,5)β(1,6), correlating the structure of this anhydro sugar with that of levoglucosan, mannosan and altrosan; and the structure of 2,3-benzylidene-D-mannosan (1,5)β(1,6) has been proved.

In connection with the study of the correlation of the configurations of certain α- and β-glycosides with those of levoglucosan and other anhydro derivatives of the sugars, methods have been developed for the rearrangement of tetraacetyl-β-phenylglucoside to tetraacetyl-α-phenylglucoside and for the transformation of tetraacetyl-α-methylglucoside and other acetylated glycosides to the corresponding acetylated phenylglycosides; the first synthesis of D-mannosan (1,5)β(1,6) was carried out by means of the alkaline cleavage of β-phenylmannoside; and some new compounds and new data for a number of phenylglycosides were obtained.

Structural studies on acetals of sugar alcohol continued, including studies on 2,3,4,5-dibenzylidene-D-mannitol and its derivatives, 2,3,4,5-dibenzylidene-D-sorbitol, 2,3,4,5–dimethylene-D-sorbitol dimethylene-perseitol and on the structure of benzylidene-α-glucohepitol.

Other researches in this field included: The syntheses of lactose and its epimer and the synthesis of cellobiose; studies on the oxidative degradation of L-glucoheptulose; application of periodate oxidation to polygalitol, showing it to have the same ring structure as styracitol, which is believed to be 1,5-anhydro-D-mannitol; studies on the structure of di-o-nitrobenzylidene-dulcitol; proof of the structure of 1,2,3,4,-dibenzylidene-D-sorbitol; hydrolysis studies on 3,4-anhydro-D-mannosan (1,5)β(1,6) and on 2,3-anhydro-D-galactosan (1,5)β(1,6); preparation of a new isomeric 2,3,4,5-dibenzylidene-dulcitol; prepara-

tion of a new compound, 1,6-dibenzoyl-2,3,4,5-dibenzylidene-mannitol; preparation of glycerol from manitol; a study on the structure of 2,3,4,5-diacetone-L-fucitol; proof that the benzal groups in α-dibenzal-L-fucitol are in the 2,3,4,5-positions; and a continuation of studies on glucooctose, obtaining a crystalline substance on reduction of α,β-glucooctonic lactone analyzing correctly for α,β-glucooctose.

Researches on starch.—The starch researches included: A series of exact experiments on the periodate oxidation of starch; extensive studies on its solubilization, resulting in improved methods for making soluble starch; production of crystalline β-methylmaltoside by an improved procedure; determination of the yields of Schardinger dextrins from butanol-soluble and butanol-precipitated fractions; studies on the action of purified amylases upon α- and β-dextrins; and evidence of a chemical nature as to the molecular size of β-dextrin.

Enzyme researches.—Studies were made on the action of highly purified yeast invertase preparations toward a series of carbohydrates and derivatives representing several glycosidic linkages. Highly purified invertase preparations from brewers' bottom yeast were found to contain an α-galactosidase which was capable of hydrolyzing α-phenyl-D-galactoside, melibiose, and α-methyl-D-galactoside; very small amounts of a β-D-glucosidase and a β-D-mannosidase were found in preparations from both brewers' and bakers' yeasts; and no evidence could be obtained to indicate the hydrolysis of α-D-glucosides, α-mannosides, β-galactosides, melezitose, or isosucrose by these invertase preparations.

Chemico-bacteriologic studies.—Studies were continued on the purification of the amylase of *B. macerans* and that of *B. polymyxa*. Other organisms, including *Hemophilus pertussis* and *B. subtilis*, have also been investigated, but no other bacterium has been found to yield readily potent amylase as do *B. polymyxa* and *B. macerans*.

A study of the action of various purified amylase preparations on the crystalline dextrins has shown that the β-dextrin was much more susceptible to the action of these enzymes than the α-dextrin. In a study of the action of various bacteria on the dextrins, it was found that *B. macerans* has some action on β-dextrin, as evidenced by the formation of much acid and gas in cultures in which no other carbohydrate than the dextrin was present. The formation of acid from β-dextrin by certain cultures of *Listerella* suggests a possible usefulness of β-dextrin in the differentiation of bacteria.

Necessary materials were prepared for the study of biological oxidations by *Acetobacter suboxydans*. This work included the preparation of fucose from seaweed for conversion to fucitol. Preliminary experiments indicated that the oxidation of fucitol by *Acetobacter suboxydans* may also give quantitative yields.

Steroid investigations.—The aim of these investigations has been the development of methods for the preparation of certain hormones. Preliminary work has included the degradation of ergosterol by photodehydrogenation, leading finally to a ternorcholatrienic acid, and study of the structure of bicholestadiene, involving the preparation of certain derivatives of the products of ozonolysis of cholestadienone.

Analytical work.—The analytical work included 52 analyses of arsphenamines and neoarsphenamines, 7 of tryparsamide, 13 of phenar-

sine hydrochloride, and 23 of related arsenicals; 20 examinations of pharmaceuticals and 10 of toxoids; 73 preparations of standard solutions; 340 micro determinations in connection with the sugar researches; and about 155 analyses of miscellaneous materials.

Division of Chemotherapy

Senior Surgeon W. H. SEBRELL, Jr., in charge

Malaria.—Synthesis of new drugs for the treatment of malaria was continued, and approximately 500 tests were made against avian, simian, and human malaria.

Sulfonamides and related compounds.—Factors affecting absorption, retention, conjugation, and excretion of sulfanilamide were studied. Fasting, acid-producing diets, and drugs favoring a state of acidosis promote the absorption and retention of sulfanilamide and tend to reduce the rate of acetylation. Work is in progress on the effects of glycuronic and cevitamic acid.

Pharmacologic and chemotherapeutic properties of nine compounds were studied. Comparison of a series of sulfonamides on anaerobic bacteria *in vitro* showed little effect from amino compounds, but high activity from nitro derivatives. Experiments on the bacteriostatic action against the tubercle bacillus indicate high activity for sulfone derivatives. Further studies were made on the cytotoxic response of the chorioallantoic membrane of the developing chick embryo as influenced by differences of strain virulence.

Phosphorus metabolism in tuberculosis.—The blood phosphatases in relation to the acid-soluble phosphorus distribution in the plasma and red cells of experimentally infected guinea pigs were studied. A deviation from the normal pattern was observed. This change was characterized by elevation of plasma phosphatase and increase in the ester phosphorus fraction of the red blood cells. The latter appears to be related to the secondary anemia often associated with the infection.

Hepatotoxins as influenced by dietary factors.—Structural and functional liver damage produced by azobenzene, p-aminoazobenzene, and p-dimethylaminoazobenzene has been studied in rats. The centrolobular hyaline degeneration produced by the first two compounds is preventable by a diet high in protein. The cirrhosis and carcinomatosis produced by p-dimethylaminoazobenzene were favorably influenced by the inclusion of unheated ovalbumin in the diet. This effect may be due to inactivation of dietary biotin.

Nutrition

The division has taken an active part in the national nutrition program by assisting the Food and Nutrition Board of the National Research Council and the Nutrition Division of the Office of Defense Health and Welfare Services. Field studies were continued on the early clinical symptoms of deficiency diseases and biotin deficiency in man is being studied.

Dietary liver damage.—Rats have been given a diet low in choline and in protein; the protein fraction of the diet has been casein which, in the quantity used, supplies an insufficient amount of the sulfur-containing amino acids. Under these conditions many rats died with

hepatic cirrhosis or hemorrhage and necrosis or with a combination of these syndromes. Evidence has been accumulated to support the view that choline has a preventive action on the development of this liver cirrhosis, while the sulfur-containing amino acids have a preventive action on the development of this hepatic hemorrhage and necrosis.

Sulfaguanidine.—Rats given sulfaguanidine in an apparently adequate so-called "synthetic" diet developed characteristic clinical signs and died. Hyaline sclerosis and calcification of blood vessels have been found in histologic examination.

Thiamine.—It has been found that the ingestion of alcohol or whisky by thiamine-deficient rats delays the onset of polyneuropathy. This indicates the probability that alcohol requires no thiamine for its metabolism. A few of the rats have died with no observed polyneuropathy but with an ascites, hydrothorax and distinctive cardiac pathology. The conditions necessary for the production of this pathologic state are being investigated.

Deficient diets and infections.—It has been shown that a partial deficiency of either riboflavin or thiamine greatly increases the susceptibility of mice to a lethal infection with pneumococcus, type I. After the mice have been infected, however, administration of the vitamin to correct the deficiency has a deleterious rather than a beneficial effect on the progress of the disease.

Vitamin assays.—A critical study of some of the vitamin assay methods has been made. It has been found that charcoal may remove part or all of an essential ingredient from casein hydrolysates.

Division of Industrial Hygiene

Medical Director J. G. TOWNSEND in charge

There has been an acceleration of the division's efforts toward a national industrial hygiene program and its integration with all agencies concerned. With additional funds made available under the Emergency Health and Sanitation appropriation, it has been possible to add to the personnel and facilities for meeting the emergency.

Cooperative Programs

Program With the States

Inspections of industrial hygiene activities in 36 States were made to obtain first-hand information on the problems confronting the war industries in these States. On the basis of such information, it was possible to appraise existing facilities for providing the necessary services and to determine the extent to which the State services should be augmented. Thereafter, personnel recruited and trained by the division were assigned to assist State and local units in their expanded programs. By the end of the fiscal year, 39 persons were on loan in 23 States, the District of Columbia, and the Tennessee Valley Authority. Essential field and laboratory equipment also has been loaned to many of the States.

Five new industrial hygiene units have been established, making a total of 45 such units in 36 States, 4 cities, 2 counties, 1 Territory, the Tennessee Valley Authority, and the District of Columbia. These States contain nearly 95 percent of the Nation's labor force. The

State and local units employ some 350 trained individuals and spend slightly more than $1,000,000, of which two-thirds were derived from Federal grants-in-aid.

Reports received from 25 State industrial hygiene units showed that 7,500 investigations, involving approximately 2,000,000 workers, were made. Analysis of the results indicated a need for expansion of programs to reach more workers, for more follow-up work in plants, for stimulation of occupational disease investigations, and for reporting of absenteeism due to all disabilities.

Program With the War Department

An important function is the inspection of Government industrial plants for the War Department. Fifty of the 143 plants certified to this division for inspection have been investigated by teams composed of physicians, engineers, and chemists, and reports of findings and recommendations have been submitted. In addition, 23 reconnaissance surveys were made in plants which were not in full production. An engineer was assigned to the Office of the Chief of Ordnance as liaison officer. A manual on engineering control of environmental hazards was prepared for use in ordnance plants.

Programs With Other War Agencies

Cooperative programs have been developed with the War Production Board and the War Manpower Commission concerning the employment of handicapped persons in war industries, optimum hours of work, the utilization of management-labor committees in the War Production Drive, and the preparation and distribution of health education materials. The Chairman of the War Production Board and five Board members issued a joint statement appealing to labor-management committees in war plants to reduce accidents and illness both in the plant and in the community. The committees were at the same time referred to the Public Health Service for advice on the development of health conservation programs. Many requests have been received for such advice and an outline of a recommended industrial hygiene program has been prepared.

The division has represented the Public Health Service on a joint committee representing eight Federal agencies to consider hours of work for maximum production and on technical committees of the Office of Price Administration. Technical services have been given to the Office of Civilian Defense in connection with the development of black-out procedures in war plants and of emergency industrial medical service in the event of disaster, sabotage, or enemy action.

Industrial Nursing

Six more States added the services of nursing consultants to their staffs, bringing the total number of States with such services to 13. In a few localities a plan was developed for providing nursing services to small industries through the utilization of local visiting nurse associations. Several schools and universities have inaugurated courses in industrial nursing.

Industrial Dentistry

The division has undertaken the promotion of industrial dentistry through the State and local health departments which have industrial hygiene divisions. The objective is to include dental examinations

in pre-employment and periodic examinations, to coordinate the work of State dental directors and industrial hygiene directors, and to set up demonstration dental services in selected plants.

Medical Services

A study of medical service facilities in plants representing all types of industries has been initiated. The Chairman of the Council on Industrial Health of the American Medical Association has been appointed as consultant to this division with a view to effecting a closer relationship between the medical profession and official industrial hygiene agencies.

National Conference of Governmental Industrial Hygienists

The annual meeting of the National Conference of Governmental Industrial Hygienists was held jointly with the Subcommittee on Industrial Health and Medicine, Office of Defense Health and Welfare Services, under the sponsorship of this division, April 9–11, in Washington. The conference adopted two resolutions, recommending (1) the continuance and expansion of the program now being carried on by this division and other governmental industrial hygiene units, especially as it relates to services for small plants; and (2) the extension of general public health services to war workers and their families.

Education

Lectures and laboratory demonstrations for Emergency Health and Sanitation personnel were given, and the division continued to train State personnel. A workers' health education program was launched in cooperation with the Division of Sanitary Reports and Statistics.

Laboratory Research

Over 85 reports have been published presenting the results of laboratory research on various hazardous substances and conditions encountered in war industries. A series of bulletins has been issued giving a review of the literature on the toxicity and potential dangers of aromatic and aliphatic hydrocarbons, the aromatic amino compounds, and nitrous fumes.

Collaboration with the American Standards Association has been continued on the establishment of emergency standards for defining the amount of toxic substances which may be permitted in the air of work places without injury to the worker.

Studies of Toxic Substances

PETN.—The toxicity and potential dangers of this new explosive, on which no toxicologic information was available, have been investigated and the results submitted to the Office of the Chief of Ordnance of the War Department before PETN was used on a large scale.

TNT.—A method has been developed to determine TNT, 2,6-dinitro-4-hydroxylamine-toluene, and 2,6-dinitro-4-aminotoluene in urine. The last can be detected in urine before the Webster test becomes positive; the new method, therefore, is more sensitive. Animal experiments have been initiated to produce TNT poisoning and to study the excretion of these various products at different stages of the poisoning.

Toluene.—The experimental work on the effect of toluene on humans and animals has been completed. No injurious effects on the blood-forming organs were observed in rats exposed to concentrations of 200 to 5,000 parts per million. Liver changes, consisting of apparent endosmosis, paralleled the changes in liver weight and volume which increased with increasing concentrations. Hippuric acid concentration in the urine increases with the concentration of toluene and persists for a number of days after completion of exposure. It appears also that toluene disappears rather promptly from the blood after exposure has been discontinued. A maximal permissible concentration of 200 parts per million in air has been suggested.

Acrylonitrile (vinyl cyanide).—Because of its importance and increased use in the manufacture of synthetic rubber, a knowledge of the toxicity and potential dangers of this material became necessary for the determination of adequate methods of control. The effects produced by repeated daily exposures of various animal species indicate no evidence of cumulative effects of acrylonitrile; 153 parts per million of acrylonitrile in air are toxic to guinea pigs, rats, rabbits, and more toxic to monkeys and cats. A tentative maximal permissible concentration of 20 parts per million in air for 8-hours' daily exposure has been suggested.

Ethylene glycol ethers.—The acute toxicity of the vapors of methyl, ethyl, propyl, isopropyl, and butyl ether of ethylene glycol has been determined. Observations on continuous exposure to one-tenth the minimal fatal concentration of these materials have been made to determine changes in the blood picture and organs; the findings are being evaluated with reference to chronic effects.

Methylene chloride.—Monkeys, dogs, rabbits, guinea pigs, rats, and cats were exposed to air containing methylene chloride in concentrations of 490 parts per million and 1,200 parts per million, 8 hours per day, 5 days per week for 14 weeks. Observations included hematological studies, effect on growth, pathology, and outward signs of distress. The relation of concentrations of methylene chloride in blood to intensity and duration of exposure was determined.

Beryllium.—Beryllium has become increasingly important because of the unusual mechanical properties of some of its alloys. In its fabrication it is claimed that exposure to the fumes and gases of the electric furnaces is injurious to workmen. To evaluate the toxicity of beryllium and to assist in defining safe working conditions, animals have been exposed to compounds of beryllium and to the fumes of beryllium fluoride and beryllium silico-fluoride. The experimental work so far has revealed that beryllium oxide, carbonate and phosphate, and beryl are not particularly toxic by mouth unless given in large amounts. Beryllium sulfate and chloride show a more pronounced effect. Except for the carbonate, this same order of toxicity was observed by intraperitoneal injection methods. On inhalation of the dust, the order of decreasing toxicity was found to be as follows: Beryllium fluoride dust, anhydrous beryllium sulfate, beryllium carbonate, and beryl. Exposure to fumes from the electrolysis of a molten bath of beryllium oxyfluoride and barium fluoride was invariably fatal to guinea pigs. Tentatively, the toxicity of beryllium appears to be intermediate between that of magnesium and zinc.

Vanadium.—Vanadium finds its chief use in the manufacture of special steels. Experiments so far have demonstrated that vanadium has a pronounced inherent toxicity irrespective of the mode of entry, whether by mouth, intraperitoneal injection or by inhalation. Vanadium was shown to be noncumulative and definite figures have been obtained for the minimum lethal dose by mouth and injection. Inhalation experiments have produced results which will assist in establishing safe working concentrations.

Lead.—Investigation of the relative toxicity of the molecular components of lead arsenate compared with calcium arsenate and lead carbonate showed the arsenate group to be the most toxic component. Investigation of the various body tissues following lead absorption demonstrated the transitory nature of lead present in the soft tissues. A new method for the identification of lead in bone tissue was described and the localization of lead in this tissue was demonstrated. A rapid method for the analysis of lead in urine and in drinking water was developed.

Aviation Medicine and Applied Physiology

At the request of the United States Navy, tests are being made to evaluate the efficiency of flight clothing, especially electrically heated suits. Investigations at the request of the Bureau of Aeronautics are in progress to determine the suitability of various types of containers for packaging distilled water for emergency use.

Studies have been undertaken to determine the most reliable method for the administration of dark-adaptation tests, the effect of altitude on visual acuity and the use of visual devices for the improvement of night vision.

A study has been made using sheep and other experimental animals on the effect of decompression to high altitudes with respect to rates of ascent, altitudes, time of exposure, and oxygen treatment. A theoretical and experimental study of the relation of pressure changes to bubble formation in liquids with reference to problems of aeroembolism was completed.

Various experiments with certain chemicals to render sea water potable were undertaken at the request of the United States Navy. A comparison was made of the effectiveness of 6 available instruments to test the ability of men to drive at night. About 35 Army truck drivers were tested at 2 different times. A report has been made to the United States Army. Confidential reports have been submitted at intervals to the United States Navy, United States Army, and National Research Council.

Industrial Bacteriology

Further investigation has been made on the etiology of an acute illness occurring among workers using low-grade stained cotton. This illness occurred among workers on rural mattress-making projects, in cotton mills, cotton-seed processing plants, and upholstering plants. Reports of this illness have been received from 25 States and 2 Canadian Provinces. The illness is characterized by sudden onset, 1½ to 3 hours after exposure, and is of short duration, usually 24 to 48 hours. It is respiratory in nature with symptoms similar to those of influenza.

A flagellated and capsulated bacterium producing mucoid colonies has been isolated from over 60 samples of cotton known to have caused the illness. The organism was demonstrated on the outside and within the lumen of the individual cotton fibers. They were not found in high-grade or normal cotton. The cultural characteristics of these organisms tentatively placed them in the genus *Aerobacter*. A heat stable endotoxin-like substance was found in filtrates from saline extracts of stained cotton and in broth cultures of the organisms isolated from the cotton. Human-exposure experiments and intradermal skin tests demonstrated that the same type of disabling illness could be produced by inhalation of dust from stained cotton containing a high incidence of the organism, from sterile cotton contaminated with the organism, and from sterile cotton treated with the filtrate. This acute illness closely resembles "mill fever," "Monday fever," and "gin fever" observed in the cotton-mill workers. It is, therefore, possible that this organism or its toxic products may be responsible for these diseases. Conferences held with officials from the Department of Agriculture have emphasized the importance of this organism in cotton, both with regard to its toxic nature for man and the possibility of its causing physical changes in cotton.

More than 3,000 environmental samples of a variety of organic and inorganic materials collected in various arsenals and ordnance plants were examined. Special methods were developed for the determination of many new substances introduced into industry. Examinations were also made of samples submitted from different States and Territories. X-ray diffraction methods have been extended to include a study of particle-size determination of various dusts as well as the identification of the mineral content in dry lung tissue.

Analysis by spectral absorption—The ultraviolet and infra-red spectro-absorption instruments have been extensively used for the quantitative determination of commercial solvents and other organic substances. The instruments are routinely employed in the examination of environmental samples collected in arsenals and other military establishments. A spectro-photometric method for the determination of hemoglobin and carbon monoxide hemoglobin has been developed.

Field Investigations

Dermatoses investigations.—Field studies were concentrated particularly on war industries. Visits were made to 51 Government establishments as a part of the industrial hygiene surveys conducted by the division for the War Department. Thirty-six other industrial establishments, most of which were engaged in the manufacture of war materials, requested services. The number of consultations with industries, health agencies, physicians, and others has increased.

A study of the penetrability of various materials by mustard gas was completed and recommendations for protective clothing were submitted to civilian defense authorities. The laboratory also has been cooperating actively with the Army and Navy in the solution of various dermatologic problems. These activities have included patch tests to determine the skin-irritating properties of 6 types of reclaimed and synthetic rubbers; and tests to determine the irritating properties of a special ointment for the protection of the skin against war gases.

Numerous protective ointments against tetryl and TNT have been developed and one of them has proved successful in reducing the incidence of tetryl dermatitis by two-thirds in a shell-loading plant.

A new industrial skin cleanser, particularly suitable for industrial workers who cannot use soap, has been developed.

Six dermatologists were appointed as consultants to the staff and the first meeting with the group was held at the National Institute of Health. At the dermatologic clinics conducted at the Public Health Service Dispensary in Washington and at the National Institute of Health, 1,457 examinations and treatments were given.

Sickness among industrial workers.—Analysis of monthly reports from a group of industrial sick benefit organizations covering about 250,000 male employees was continued during the year and results published quarterly. Data for the calendar year 1941 showed notable excesses in rates for pneumonia and bronchitis.

A report on the regional variation in disabling sickness among a group of Negro male railroad employees showed no evidence that conditions in the North produced a greater frequency of disabilities lasting 8 calendar days or longer than conditions in the South. A study on disabling sickness among glass workers showed that the number of days of disability because of the rheumatic diseases was over 50 percent greater than the number accounted for by influenza and grippe.

An analysis of absences on account of sickness among workers of a public utility, showed for 1941 an average rate of approximately 7.5 days per male per year. Efforts have been continued to stimulate the recording of absenteeism and progress has been made.

Engineering studies.—The following investigations were made: Lead and sulfur dioxide in the area surrounding a smelter; lead exposure at a Navy proving ground; carbon monoxide and nitrogen oxide exposures at an Army proving ground; and a major study, begun this year, of the engineering control of benzene and other harmful solvents.

Division of Infectious Diseases

Senior Surgeon CHARLES ARMSTRONG in charge

Rickettsial Diseases

Typhus.—Vaccine was manufactured in quantity for the use of the armed forces, 490,000 cc. being made for this purpose. A large-scale field test to determine the value of the vaccine in the control of epidemics was set up in Bolivia. A laboratory test (complement-fixation) was developed. Application of this test to the location of foci of infection among rats was under study during the year. A comparison of the complement-fixation and the Weil-Felix reactions is now in progress.

Typhus virus was isolated from house mice taken in the Southern States. The etiologic agent was also isolated from chicken fleas captured in the South.

Rocky Mountain spotted fever.—Cases of Rocky Mountain spotted fever have been reported from 67 counties which had not previously been known to have the infection. Yolk-sac vaccine in comparison with tick-tissue vaccine was evaluated. Both types of vaccine were furnished on request, a total of 680,500 cc. having been distributed.

Virus Diseases

Yellow fever.—Vaccine suitable for human use has been prepared in the amount of 570,240 doses, of which 192,720 have been distributed. Production is being increased greatly to meet the needs of military personnel. This vaccine is now being prepared without the use of human serum.

Epidemic encephalitis.—Extensive field and laboratory studies were made of the 1941 outbreak of epidemic encephalitis in the North Central States and in adjacent Rocky Mountain States. Of human serums tested, 47.5 percent protected against western equine encephalomyelitis virus and 9.0 percent against St. Louis encephalitis virus. The percentage of positive tests against the latter was highest in Nebraska, Iowa, and Colorado. Tests of horse serums gave essentially parallel results to those of human serums.

Pneumonia

Field study on prophylaxis.—The field study on prophylaxis against pneumonia in the general population has been conducted in cooperation with the Maryland State Department of Health and deputy State health officers in 19 counties. During the past 2 years, 40,724 individuals, from 2 to 80 years of age, were injected with polysaccharide antigen in a dose which has been found optimum for stimulating antibody. Studies have been made of institutionalized individuals in the hope of establishing the degree of correlation between the ability of the host to manufacture antibody and the susceptibility to pneumococcus infection.

Immunological paralysis.—Blockade of the immunological system in mice has been studied for eleven months. Large numbers of mice have been paralyzed by a preliminary inoculation against types I, II, and III polysaccharide, and an equal number of mice of the same age have been kept as controls. Whereas control mice were immunized to normal degree, the mice which received a paralyzing dose 11 months previously were still refractory to this dose of antigen. Thus far no procedure has been discovered that will restore paralyzed animals to their normal immunological state.

Heart Disease

Clinical and pathological studies of patients with rheumatic fever were continued. An investigation of the possible antigenic specificity of cardiac tissues was completed and an attempt was made to apply the findings to the study of rheumatic fever. An investigation demonstrating that rheumatic fever probably can be incited by an attack of german measles, apparently in the absence of concomitant hemolytic streptococcus infection, was completed.

Malaria

War activities.—At the request of the office of the surgeon of the Fourth Corps Area, a series of training courses in blood-film diagnosis of malaria was given to Army technicians.

An efficient hand sprayer has been developed for use by small detachments of troops and in airplanes. A key and guide to southeastern aquatic plants was prepared for use in the field. Surveys of mosquitoes and malaria conditions in certain bases were made for the United States Navy.

Parasitology, immunology, and malaria therapy.—Studies on immunity to malaria (*P. cynomolgi*) in monkeys, and on production of bacteriologically sterile living mosquitoes are in progress.

Biologic studies.—Investigations designed to develop methods of mosquito control based on "naturalistic" factors were carried out.

Tuberculosis

Field studies.—Epidemiologic studies of tuberculosis in south Alabama and Tennessee have been made on selected households in which a case of tuberculosis had occurred. Studies conducted in various geographic areas of the United States have provided a technique for evaluating the factors important in the spread of tuberculosis as well as the types of pulmonary lesions which occur in household associates of a known case of tuberculosis. The incidence of pulmonary calcification in school populations determined in six counties in Iowa was found to vary from approximately 50 percent of the individuals studied in Van Buren County to less than 10 percent of the individuals studied in Winneshiek and Iowa Counties. In the other three counties, Decatur, Fremont, and Harden, intermediate incidences of occurrence were found.

Laboratory studies.—Detailed studies of techniques for evaluation of the virulence of strains of tubercle bacilli are being continued. Chorioallantoic membrane of developing chicken embryos has been employed in these studies. Accumulated evidence from extended series of observations on the *in vitro* growth of the tubercle bacillus points strongly to the presence of silicon as a normal component of the pellicle. The amount of silicon present constitutes a small but relatively constant percentage of the pellicle weight, regardless of the actual weight of the pellicle and of the concentration either of food or of silica in Long's medium. With the strains employed, better growth is obtained when the acidity of the medium is reduced well below pH 7.0.

Fungi

Coccidioides immitis was isolated at San Carlos, Ariz., from five soil samples (the third isolation from soil in the history of the disease) and for the first time from wild rodents, particularly pocket mice. These animals may constitute a natural reservoir of the infection and may be responsible for the sporadic appearance of the fungus in soil and windblown dust. An antigen was prepared from the fungi isolated and was used in skin-testing Indian school children at San Carlos and Fort Apache.

Cooperative experiments were made to determine the effects of ultraviolet radiation on pathogenic fungi. Preliminary studies of penicillin production were made and strains of *Candida parakrusei* isolated from mycotic endocarditis were studied. About 207 miscellaneous specimens or cultures were received for examination or identification during the year.

Dental Studies

Dental caries.—The evidence obtained from various epidemiologic studies on dental caries during the past few years has justified the conclusion that the intensity of dental caries attack is markedly inhibited in children who have used throughout life a domestic water with a fluoride content of 1 part per million or more. The fluoride content of

the domestic water supply between 0.0 and 1.0 part per million is apparently highly important from the standpoint of dental caries prevalence. The large amount of experimental and epidemiologic evidence, which has now been accumulated, strongly suggests the possibility of adding small amounts of fluorides to fluoride-free public water supplies for controlling dental caries in large population groups.

Studies during the year have included (*a*) investigation of possible skeletal changes in adults having more than 25 years exposure to fluoride waters containing about 5.0 parts per million; (*b*) determination of the time required to influence dental caries attack when the fluoride content of the public water supply is increased; (*c*) clinical and bacteriologic examinations of children in two Midwestern cities prior to the inauguration of sugar rationing for the purpose of evaluating its future effects; (*d*) characteristics of oral flora in relation to various domestic water supplies, the laboratory work confined principally to growth requirements of *L. acidophilus* and the influence of fluorine and the field study directed to the relation of oral flora to intestinal flora in a selected population group with reference to the occurrence of *L. acidophilus;* (*e*) analyses of about 575 human saliva samples for total solids, ash, nitrogen, isoelectric zone and nitrogen in total solids, giving indications of possible correlation between (1) total solids, (2) total nitrogen, and (3) nitrogen in total solids, and human dental caries; (*f*) experimental studies of the practicability of adding fluorine post-eruptively to the enamel of adult teeth; (*g*) influence of fluoride waters on permanent tooth-eruption rates.

Ulcerative stomatitis.—During the past year an increased prevalence of Vincent's infection (trench mouth) was reported in the armed forces and among industrial workers in the British Isles. Because little is known concerning the etiology, communicability, and treatment of this disease, preparations have been completed for epidemiologic studies of the syndrome. Laboratory studies have been directed toward the development of a simplified method for cultivating oral spirochetes. Several strains have been obtained in pure culture and a technique has been developed for isolating certain of these organisms in the first subculture.

Leprosy

Work has been in progress with an acid-fast organism isolated from leprous human tissue. This organism produces granuloma in rats and produces a relative immunity against rat leprosy.

Activities at the United States Leprosy Investigation Station in Honolulu consisted of studies of difficult problems of leprosy and medical care of patients in the adjoining territorial receiving hospital.

Studies were continued on the relation of the syphilitic serologic tests to the sedimentation rate. Previous observations were confirmed that lepers with a rapid sedimentation rate were more likely to have positive syphilitic-serum reactions than were those with a low rate.

Enteric Infections

Chemotherapy.—Major attention has been given to the efficacy of chemotherapy in clinical treatment and in control. Shigella infections due to Flexner, Newcastle, and Schmitz varieties were terminated promptly (usually in 24 to 48 hours) by sulfaguanidine. Few Sonne infections have been observed and Shiga infections were not encountered. Clinical symptoms were readily controlled and carriers cleared

of infection. Comparable but less extensive tests of sulfasuxidine indicated that this compound is also effective.

Epidemiology.—A group of patients was studied continuously in an attempt to determine (*a*) the normal duration of an infection with the dysentery bacillus and (*b*) the extent and duration of immunity in the individual. Attempts to correlate agglutination reactions with known infections, both current and past, were unsuccessful.

Other Investigations

Pertussis.—The technique of testing antigens and drugs in mice has been improved and it has been shown that sulfadiazine inhibits the growth of *H. pertussis* in the mouse lung. Further experiments on the value of various fractions of *H. pertussis* as antigens were made.

Hemolytic streptococci.—Studies were continued on cross protection between the agglutinogenic types of group A. It was found that the strains of the (Griffith) types 6, 14, 15, 18, 19, and 23 are closely related immunologically, for the serum prepared with a strain of any one of those types will give protection against the strains of other types of the serologic group.

Leptospirosis.—Various types of vaccines produced from *L. icterohaemorrhagiae* were shown to immunize mice and hamsters against infection with virulent strains of this organism. Immune serum produced in rabbits immunized against *L. icterohaemorrhagiae* was efficacious in treatment of leptospirosis in experimental animals.

National Cancer Institute

Pharmacologist Director CARL VOEGTLIN in charge

National Advisory Cancer Council

The National Advisory Cancer Council held three meetings during the fiscal year. Six grants-in-aid were recommended. Twelve grants-in-aid totalling $78,146 were certified for payment. The committee on coordination in research pursued its program on gastric cancer and promoted a conference on the relation of hormones to atypical growth.

Experimental Production of Cancer

Of fundamental significance was the demonstration of the conversion of normal mouse subcutaneous fibroblasts growing in *in vitro* cultures into cancer cells, as the result of the prolonged exposure of the normal cells to a potent cancer-producing chemical of known chemical structure, namely, methylcholanthrene. The recent observations confirmed earlier studies indicating that the normal cells under the influence of the carcinogen gradually undergo characteristic changes which are apparently irreversible and persist indefinitely after the removal of the carcinogen from the cultures. Such cultures of altered cells, upon subcutaneous injection into mice of the same inbred strain from which the normal cultures were obtained, produced tumors within two weeks. Microscopic examination of these tumors showed evidence of rapid cell proliferation, lack of encapsulation, and marked infiltration of adjoining muscle tissue, thus justifying the diagnosis of fibrosarcoma. This observation shows that the production of these tumors does not involve the intervention of systemic factors, but is

brought about by a direct interaction between the cancer-producing chemical and the normal cells outside the animal organism. This opens a wide field of research on the malignant transformation of cells under relatively simple conditions.

Further work on the mode of action of carcinogenic agents on small free-living forms has led to two biologic generalizations: (1) A given environment at first harmless to the individual organism may in time be fatal to the species provided the exposure is continuous, and (2) when the exposure is rhythmic, a species can successfully adapt to the same or greater intensity of the same environment that is fatal when the exposure is continuous.

Work was carried forward on the nature of, and on the conditions under which the so-called mammary tumor inciter acts in the production of mammary carcinoma in mice. This agent was transmitted through five generations of C mice, though only the first generation had been exposed to this agent as a result of foster nursing by C3H females. Forced feeding of milk, mammary gland, or tumor extract to 10-day-old susceptible females produced mammary tumors when the mice were 6 months of age or older.

Genetic experiments have shown that the susceptibility of mice to induced and spontaneous lung tumors is inherited as a quantitative character involving many genes, as in the case of other rather complex physiologic characters such as size, susceptibility to infections, and leukemia.

The study of the possible influence of inhaling tobacco smoke on the production of lung cancer at present indicates that the incidence of lung tumors in in-bred mice is not raised by long continued drastic exposure of the animals to tobacco smoke.

Investigation of the presence of carcinogenic material in the ordinary atmospheric dust of industrial cities and of the Holland Tunnel was continued. Dust from the latter source was fractionated. Some of the extracts produced sarcomas upon subcutaneous injection into mice, confirming previous findings.

The production of lung cancer in mice by the intravenous injection of methyl-cholanthrene was continued. It was found that tumors occur 10 times more frequently if the particle size of the methylcholanthrene in the dispersion used is increased from 1 to 2 to 10 to 20. The neoplastic reaction depends upon the actual amount of hydrocarbon that lodges in the lungs and not upon the amount injected, indicating that the reaction is a local one upon the susceptible pulmonary tissue, rather than a systemic effect.

The work on the production of gastrointestinal cancer was continued. The injection of 20-methylcholanthrene, 3,4-benzpyrene or 1, 2, 5, 6-dibenzanthracene into the wall of the glandular part of the stomach of 293 mice of 6 inbred strains induced the following tumors: 44 adenomas, 8 adenocarcinomas, 8 adenoacanthomas, 18 mixed adenocarcinomas and sarcomas, 2 mixed adenoacanthomas and sarcomas, and 29 sarcomas. The adenocarcinomas were all induced at the site of the injection of a heavy colloid dispersion of methylcholanthrene in horse serum within 19 to 46 weeks. In striking contrast with these results was the failure to produce glandular gastric tumors in mice by the oral administration of the same 3 carcinogens.

Comprehensive studies were completed on the production of liver tumors. The subcutaneous injection of 2-amino-5-azotoluene into

mice inducted hepatomas besides pulmontary tumors, and hemangioendotheliomas. The fate in the body and the carcinogenic mechanism of p-dimethylamionazobenzene were explored. No tumors were induced by the implantation into the rat liver of pellets containing the metabolic products of this dye. Liver tumor formation was promoted by dietary biotin, cystine, and inositol, whereas riboflavin and large amounts of casein together retarded the carcinogenic process. Production of liver tumors by azo dyes apparently depends on a balance of vitamins, sulfur-containing amino acids, and choline.

In other experiments with mice it was found that repeated oral administration of the anthelmintic carbon tetrachloride resulted in a high incidence of well-differentiated hepatomas. One of these was transplantable. Single, or only a few doses of carbon tetrachloride, caused hepatic necrosis followed by repair and study of spontaneous and induced liver tumors resulted in a satisfactory classification of these tumors on a histogenetic basis.

The induction of skin tumors in white mice by ultraviolet radiation was further studied, with particular reference to dosage relationship. The rate of tumor induction was affected both by the dose of radiation and the interval between doses. A minimum period for tumor induction existed for a given schedule of dosage and increase of dosage above a certain value did not reduce this minimum time. The minimum induction time is altered, however, by altering the frequency of exposure; it is less for more frequent exposures. Observations were made on tumor induction with X-rays under specified conditions, with indications that the occurrence of leukemia and aleukemia was enhanced.

Characteristics of Malignant Tumors

Extensive experiments, by a modified Warburg technique, with liver cancers of rats, chicken tumors and leukemias, and mouse leukemias of lymphoid and myeloid origin, compared wherever possible with normal homologous tissues, have led to the following conclusion: The metabolism of malignant tissues may be detected with a high degree of specificity, provided that a sufficient number of metabolic properties are studied.

The influence of glucose injections on the pH of hepatic tumors in living rats and mice was studied by means of the capillary glasselectrode. The tumor tissue, as a rule, showed a lower pH than the normal liver and a considerable downward drift after glucose, whereas the normal liver pH remained about constant. The fall of tumor pH was accompanied by an increased lactic acid content.

Differences in the cytochrome oxidase content of various tumors and normal tissues were found. Cytochromes a, b, and c were shown to be present in several tumors. The d-amino-acid oxidase systems of liver tumors and normal liver were studied. Hepatoma 31 was found to contain 50 percent more ascorbic acid than normal liver.

Because of its importance to the cell nucleus, estimations of the molecular weight of sodium thymonucleate were made, using the ultracentrifuge and diffusion constant methods. The results gave a value of 2 million. The addition of strong salt solution appears to change the material from a chain type to a globular type of structure.

Studies were made of the arginase, catalase, xanthinadehydrogenase amylase, thymonucleodepolynerase, and acid and alkaline phosphatase activity of many malignant tumors and normal tissues. The conclusion was reached that the enzymatic changes associated with the transformation of a normal into a malignant tissue depends on many factors, *i. e.*, the particular enzyme affected, the particular tumor studied and the tissue from which it arose, and the animal species.

Evidence was secured to show that the progressive growth of certain malignant tumors results in a striking decrease of catalase in the histologically normal liver of the tumor-bearing animal. This change was correlated with the rate of tumor growth and was promptly reversed upon excision of the tumor. These observations prove that the growth of a malignant tumor exerts a pronounced biochemical action upon the apparently normal liver.

Diagnostic and Therapeutic Studies

Until recently it has not been possible to differentiate cancer cells from the normal cells of their origin by means of cytologic criteria. This has now been accomplished in the case of experimental hepatic tumors. The malignant transformation is regularly accompanied by a shift in Golgi apparatus from a partially peripheral to a completely juxtanuclear position in the cell. Similar studies were made with other types of animal neoplasms, of the organs of tumor-bearing animals, and human tissues.

The diagnostic test of Brdicka, showing the presence of increased amounts of cystine-containing protein split-products in the blood of human cancer patients, has been repeated and extended, and similar changes in the blood of rats bearing induced and transplanted tumors have been demonstrated.

The growth rate of mammary carcinoma in mice was found to be markedly decreased when the diet is deficient in riboflavin. This was accompanied by a considerable decrease in the riboflavin content of the tumor, liver, and skeletal muscle. Other experiments with rats carrying hepatoma 31 showed that, under certain conditions, a dietary deficiency in riboflavin also retards the growth of this tumor, since additional riboflavin causes rapid growth. On the other hand, biotin did not seem to stimulate tumor growth. Suggestive therapeutic effects were observed in rats carrying this hepatoma following the injection of radioactive arsenic.

Studies aiming at a better control of hazards incident to the clinical uses of X-rays and radium in diagnosis and therapy were continued. Assistance was given to the Army Medical School in the proper construction and testing of the Army Field X-Ray Unit.

A study of the place of residence of skin cancer patients at a Veterans' Administration hospital showed that the incidence of skin cancer was higher in residents of Southern States. Residence was determined on a person-year basis with consideration of lifetime residence of each individual.

Loans of radium to 44 hospitals were extended and 5 new loans were made. Approximately 2,250 patients were treated with radium loaned by the Institute. Twenty-nine physicians received training in diagnosis and treatment of cancer.

Volume 2 of the Journal of the National Cancer Institute was published, as was also "A Survey of Compounds Which Have Been Tested for Carcinogenic Activity."

Division of Pathology

Senior Surgeon R D. LILLIE in charge

Studies on Infectious Diseases

A tuberculous meningitis histologically similar to that in man was studied in guinea pigs inoculated intraperitoneally with strains of human tubercle bacilli which were apparently of low virulence and gave few visceral lesions. A study comparing the histologic and cytologic reactions in guinea pigs to various strains of tubercle bacilli is in progress, and the study of the pathology of pulmonary calcification in children dying in central Tennessee, Kentucky, and southern Ohio is progressing slowly.

Coccidioidal granuloma.—The study of coccidioidal granuloma occurring spontaneously in wild rodents in Arizona showed basically proliferative nodular epithelioid cell lesions, often with central necrosis. Coccidioides spherules were found in all lesions, and in some, endosporulation was present. It appears that the pocket mouse has some inhibiting influence on normal maturation and endosporulation of coccidioides spherules. The histology of the lesions suggests slow growth and chronicity of the process; chronicity seems to be a requirement for an animal host to constitute a "reservoir of infection."

In experimental influenza in mice, the immunologically distinct virus strains A and B give a pathologic picture identical in all respects.

Studies on topographic cerebral pathology were expanded to include the description of the lesions of western equine encephalomyelitis based on 13 human cases from the Dakota epidemic of 1941. Sixteen additional cases of poliomyelitis were collected, including 3 cases which had survived 1 to 4 weeks in respirators and which will illustrate the rarely observed convalescent stage of the disease.

Toxoplasmosis often appears in guinea pigs used in tests for the presence of typhus virus in wild rats. Experimental studies showed that the presence of toxoplasma occurring naturally in the rat brains probably accounts for most of the guinea pig infections.

Dietary Deficiency Studies

Recurrent artificially induced scurvy in the Rhesus monkey was characterized by a hemorrhagic gingivitis, hemorrhage into the joints, beneath the periosteum, into the muscles, beneath the skin and into the postorbital soft tissues, also by epiphyseal separation in some of the long bones and bone necrosis. When recurrent scurvy was superimposed upon calcium deficiency, marked softening of bone also occurred.

The pathologic picture of liver cirrhosis occurring in rats fed low protein and choline-poor diets is distinctly different from previously described experimental toxogenic cirrhoses and from any of the usual varieties of cirrhosis in man. A particular point of difference is the occurrence of pecular hyaline globules of ceroid in liver cells and in phagocytes, which precedes the actual fibrosis. It has been found that

restoring such "cirrhotic" animals to a normal diet or a diet high in choline causes prompt regression of fatty changes and liver cell hypertrophy and hyperplasia, but fibrous trabeculae and phagocytozed ceroid persist. The hemorrhagic hepatic necrosis of rats on low protein, cystine-deficient diets appears to be pathologically as well as etiologically distinct from the foregoing.

Toxicologic Studies

An hepatic centrolobular hyaline degeneration was encountered in animals fed azobenzene, p-aminoazobenzene, and p-dimethylaminoazobenzene. Its variation under various dietary conditions was noted and its relationship to the cirrhosis often developing with the last named compound was studied. That the ceroid which appears in paradimethylaminoazobenzene poisoning on low protein diets is not an essential part of the pathology produced by this dye, was shown by its appearance in rats on choline-poor, low-protein diets without the dye and its absence in rats receiving the dye and developing cirrhosis and carcinoma on high protein diets. Sulfaguanidine fed to rats on synthetic diets supplemented with all known vitamins of the B complex developed a very interesting pathologic picture, one of the most striking features of which was a degeneration and calcification of small arteries.

Dye Studies

Attention was focused mainly on the problem of production of satisfactory polychrome methylene blue and its constituent thiazin dyes for the staining of malaria parasites and blood. Work on standardizing Wright and Giemsa stains for the Biological Stain Commission has been expanded with a view to making available more satisfactory dyes for general laboratory use and particularly for military use.

The availability of various hitherto unused oil-soluble domestic dyes as fat stains in place of previously imported or only partially satisfactory American dyes has been investigated, and several good deep-red and brown-red dyes were found which stain well from solutions of lower alcohol acetone content than hitherto generally used. Some 37 dye samples were examined, including Giemsa, Wright, hematoxylin, eosin, Sudan III and IV.

The amount of experimental material studied increased 60 percent, reaching a total of 4,075 animals and 1,636 human specimens.

Division of Public Health Methods

GEORGE ST. J. PERROTT in charge

Health and Medical Services

Medical care in defense areas.—A number of defense areas were surveyed with a view to meeting their medical care problems. Efforts are continuing to secure physicians, dentists, nurses, and hospital facilities for areas in greatest need. Recommendations have been submitted to the Administrator of the Federal Security Agency.

Public medical care.—Studies of the provision of medical care for indigent and low-income groups were made in a number of Virginia

and Kansas counties. Acute shortages in personnel and facilities were revealed in the Virginia area. Surveys in Minnesota were completed and a report submitted to the Department of Social Security of that State. Several recommendations looking toward better administrative practice have been adopted by the counties concerned. Consultation was provided the Bureau of Public Assistance, Social Security Board, for the review of State plans for the medical care of recipients of public assistance. A report on the character and amount of curative services being rendered by city and county health departments throughout the United States was prepared for the Subcommittee on Organized Care of the Sick of the Committee on Administrative Practice, American Public Health Association.

Personnel shortages in hospitals.—To ascertain the magnitude of this problem, the division, in cooperation with the American Hospital Association, sent a questionnaire to each registered hospital in the United States, requesting information concerning current and impending needs for nonmedical professional and technical personnel. Replies revealed that private and nonfederal governmental hospitals, in January 1942, needed about 19,000 professional and technically trained persons to fill existing vacancies and that the contemplated expansion of facilities would require an additional 20,000 persons.

In January 1942, in cooperation with the Procurement and Assignment Service, a similar questionnaire was mailed to each State, city, and county health department having a full-time director. The returns indicated that there were about 1,400 vacancies in the professionally trained group, and that 4,900 new persons were needed for work made urgent by war activities.

Records and reports.—A study was made of the reports required of States by the Public Health Service and the Children's Bureau. Simplified methods of reporting to both agencies were recommended, and one of the recommended report forms is now being installed experimentally in several States.

Dental studies.—A study of the dental status of selectees has shown close correlation between dental findings in childhood and those 10 or more years later. Study was also made of the need for dental services among the young adult population, with special reference to that segment of the population from which war manpower will be recruited. Caries susceptibility, the prevalence of caries at different ages, and the yearly and long-term incidence of caries were studied.

Hearing studies.—A recently completed hearing study has confirmed previous evidence that testing and observation over relatively long periods of time facilitate the early detection of conditions which, although they may not become disabling until later life, have their origin in the formative years. Further knowledge has been gained about hearing defects, the inheritability of one type of deafness, and the meaning of degrees of hearing impairment. For the first time, by means of electrical transcription, a detailed analysis has been made of the speech characteristics of children born deaf or acquiring deafness early in life. A technique for studying the effects of methods of teaching speech in schools for the deaf is being developed.

Nutrition

The New York City cooperative nutrition studies have been continued. New knowledge has been acquired on dark adaptation, kera-

titis, and stomatitis. A new technique has been developed for exact photographic color rendition of lesions of the anterior eye and of the buccal mucosa. School lunches have been investigated and a number of suggestions made for improvement.

Housing and Health

Federal Public Housing Authority.—Upon consolidation of all public housing activities of the Federal Government under this Authority, professional personnel were assigned from the Division of Public Health Methods to carry on the activities of the health and sanitation unit. Plans for infirmaries in proposed war dormitories were developed. Policies have been initiated in regard to space requirements and the use of dwelling units for professional offices of physicians and dentists. Efforts are being made to locate physicians and dentists in war housing project areas and to establish public health clinics.

Central Housing Committee.—The Division has been represented on various subcommittees of the Central Housing Committee. A building code based on health and safety needs, primarily for war housing construction, was prepared.

Health Education

Health education in war areas.—Five health educators have been assigned to local health departments of North Carolina to demonstrate the effectiveness of community organization and education in such situations. These communities are now correcting many conditions hazardous to the civilian population and to troops stationed in nearby camps. A second demonstration program, primarily on malaria control, has been started in seven States.

Evaluation studies of health instruction.—A study of the public's knowledge of health information, based on 100,000 health information tests given at the New York World's Fair and the Golden Gate Exposition, was completed. The material constitutes the only extensive data available on adult knowledge about health. Studies of the individual health instruction given by physicians, nurses, and sanitarians were continued during the year.

Control of Specific Diseases

Tuberculosis.—X-ray photography of selectees undertaken in cooperation with the District of Columbia Health Department and the Selective Service Board was discontinued in August 1941. Since the termination of this work, a comparison has been undertaken of the relative diagnostic efficiency of 4- by 5-inch and 35-millimeter miniature X-ray plates in relation to standard 14- by 17-inch radiographs through careful roentgenologic interpretation.

In addition to the development of a 50-millimeter film having about twice the area of a 25-millimeter film and using the same candid-camera type lens, a number of experiments have been made with fluorographic equipment, all leading to more accurate identification and diagnosis. Among the more important of these is the magnification of 35-millimeter chest plates.

Environmental Sanitation

Shellfish studies.—It has been necessary to close the Craney Island Laboratory and turn the entire property over to the Navy. Over a

2-year period, a statistical comparison of methods employed in the sanitary evaluation of oysters has been made. The survey has indicated that the results obtained in any particular instance will depend upon the type of samples tested and the methods employed. The method which seems to be most consistent is the use of standard lactose for the presumptive test followed by verification with brilliant green medium. There seems to be no obvious relationship between the standard plate count and coliform scores.

Sewage and industrial wastes treatment:—Studies of the mechanism of biochemical oxidation processes in sewage and industrial wastes treatment were concluded in April 1942. Surveys of munitions wastes were continued and have furnished comprehensive data on the volume and composition of liquid wastes discharged from the manufacture of smokeless powder, nitroglycerine and trinitrotoluene. Six reports of these surveys have been submitted to the Office of the Chief of Ordnance of the War Department.

Stream and lake pollution.—The Ohio River Pollution Survey was completed and a final report, with six supplements, was prepared in collaboration with the States Relations Division for submittal to the Ohio River Committee and the War Department. A survey of shellfish areas in Raritan Bay was carried out and a full report submitted. A branch laboratory was established at Chicago in March 1942 for a bacteriologic survey of the quality of the Chicago water supply as affected by pollution of lower Lake Michigan resulting from increased war industrial operations in that area. Minor investigations included a biologic survey of Columbia River and a survey of the effects of munitions wastes on the Ohio River below Charlestown, Ind.

Methods of water disinfection.—A study of improved methods of water disinfection and its control was instituted in connection with problems of water-supply protection in areas of military importance. The chemistry and bacteriology of "break-point" chlorination have been studied, to show the most effective and economical methods of carrying chlorine residuals into distribution systems. A qualitative color test for distinguishing between free active chlorine and chloramines, adaptable for field use, has been developed. The comparative bactericidal efficiencies of free chlorine and chloramines have been investigated, using coliform bacteria as test organisms.

Drinking-water standards.—A complete revision of the official drinking-water standards has been made and a manual of recommended practice in water supply sanitation has been prepared.

Design of emergency water and sewage treatment plants.—A manual of basic engineering design for emergency water and sewage treatment plants has been prepared for various official agencies. The purpose of the manual has been to develop designs involving the use of minimum quantities of critical war materials.

Health Statistics

Familial studies.—The long-term study of children in Hagerstown, Md., initiated 15 years ago, has afforded data for the comparison of the physical status of young men examined for Selective Service with their physical status in childhood. The fact that competent complete examinations, made in early childhood, will disclose the beginnings

of adult disabilities, is of distinct significance to preventive medicine and public health. The status of the eyes, ears, and teeth of a school child was found to be, in a very exact sense, indicative of what the status of these organs will be in adulthood.

Physical impairments.—On the basis of National Health Survey data, estimates of the number of handicapped persons needing rehabilitation were prepared for a committee designated by the Bureau of the Budget to study the need of expanding the present rehabilitation program. The study took into account such factors as age, sex, extent and duration of disability from impairments, and the probable number of individuals who can be rehabilitated and added to the Nation's labor force. Analysis of some 12,000 physical examinations of Farm Security Administration clients was undertaken in cooperation with that agency.

In cooperation with the Selective Service System, papers were prepared covering the findings of the preliminary physical examination of men examined for Army service. Subsequently, upon the request of Selective Service, a statistician of the division was assigned full time to the Medical Division of Selective Service. The part-time consultation service of a principal statistician has been provided for the tabulation of physical impairments of selectees.

National Youth Administration health examinations.—The tabulation of some 150,000 health examinations of youth was completed and a bulletin on the findings was prepared jointly with the National Youth Administration. The examining physicians classified 67 percent of the National Youth Administration youth as "fit for any work," 30 percent as "fit for limited employement only," and 3 percent as "unfit for any National Youth Administration work."

Additional studies.—Provisional mortality summaries were prepared quarterly and annually from data supplied by State health departments and a summary of the prevalence of acute communicable diseases was prepared at 4-week intervals.

Division of Zoology

Professor WILLARD H. WRIGHT in charge

Trichinosis

Incidence.—Studies on the incidence of the parasite in various population groups have been practically completed. A total of 5,379 diaphragms from persons coming to necropsy in 171 hospitals in 37 States, the District of Columbia, and Puerto Rico has been examined. Positive findings were made in 855, or 15.9 percent, of the individuals.

Epidemiology.—An analysis of 4,683 of these cases indicated that there was no direct correlation between trichina infection and sex, civil or military status, past military service, occupation, urban or rural residence, hospitalization for mental disease, or socio-economic status. The group included 3,706 American Negroes and whites of English-Scotch-Irish descent, of whom 583, or 15.7 percent, were positive. There were 23 North American Indians, 71 individuals whose nationality or race was unknown, and 235 Hebrews. The remaining individuals comprised 648 persons who were of foreign citizenship or whose names indicated foreign extraction, of whom

156, or 24.1 percent, were infected. Persons in the German and Italian groups totaled 340, of whom 96, or 28.2 percent, were infected. Exposure was more frequent in persons of foreign extraction. Superinfections were encountered in several persons, including two who succumbed to trichinosis, indicating that one infection does not protect against or prevent death from a subsequent infection.

Diagnosis.—Cooperative studies were inaugurated with the City of New York Department of Health to obtain information on the number of larvae per gram of muscle required to produce clinical symptoms of trichinosis, the earliest appearance of positive intradermal and precipitin reactions, the persistence of such reactions following recovery from trichinosis, and the extent of myocardial damage resulting from the invasion of larvae. Limited data obtained up to the present time have indicated first appearance of positive precipitin reactions 11 days after infection and of intradermal reactions 23 days after infection. Positive precipitin reactions have been found to persist for 24 months following a clinical attack of trichinosis and positive intradermal reactions for 30 months. One-half of 22 cases of trichinosis showed myocardial damage as evidenced by electrocardiographic changes. Outbreaks of trichinosis involving a total of 631 persons were investigated. Of 1,081 precipitin tests, 626, or 57.9 percent, were positive, and of 582 intradermal tests, 281, or 48.3 percent, were positive.

Amebiasis

Culture studies.—Further investigations were conducted with the object of establishing *Endamoeba histolytica* in pure culture for purposes of antigen production. Oxidation-reduction potentials of cultures of the organism with various single species of bacteria are being investigated. A correlation apparently exists between the potential-time curves and the rate of growth of the amoebae. Excystation is more rapid with these bacteria which produce a rapid drop in the potential, and the amobae survive longer with the species which maintain reducing potentials. The period of active multiplication of the amoebae occurs at reducing potentials, and growth slows and finally ceases after positive levels are reached.

Previous attempts in this laboratory and elsewhere to produce regularly encystation of trophozoites of *E. histolytica* have invariably resulted in failure. Studies now indicate that encystation can be brought about by the addition of *Clostridium perfringens* to unibacterial cultures of the amoeba. The presence of this organism seems to provide some complementary factor since no cyst production was obtained in cultures of amoebae with this organism alone.

Diagnosis.—Continued improvements have been made in the methods of producing antigen from unibacterial cultures of *E. histolytica.* The identity of the symbiont formerly designated as *Leptotrichia buccalis* has been placed in a doubtful status by reason of further bacteriologic studies, and for the time being the bacterium is being referred to as "organism *t.*" Amoebae are now being grown in flasks with this organism in such quantity that 20 flasks furnish a concentrate equivalent to that formerly obtained from 300 tubes. A total of 86 experimental antigens has been produced during the year. These antigens have been employed in the complement fixation

test for amebiasis with gratifying results, and the work confirms the preliminary findings to the effect that they are much more specific and potent than are antigens previously produced from cultures of amoebae containing all the contaminating flora of the intestinal tract. Complement fixation tests have now been carried out on 149 samples of blood serum from suspected cases of amebiasis. While incomplete in many respects, information supplied by the attending physician was sufficient to evaluate the results in 101 cases. Sixty-six samples came from 35 physicians and hospitals in various parts of the United States, while 35 samples came from the United States Marine Hospital, Baltimore, Md. Results of the complement fixation tests agreed with the reported presence or absence of *E. histolytica* in 77.3 percent of the cases in the first group and in 97.1 percent in the second group.

Epidemiology.—Further studies in a New Orleans orphanage, in which infants are received at a very young age and acquire amebiasis within the institution, tended to confirm the fact that transmission was of the hand-to-mouth variety and not through the food or drinking water. Search for parasite ova and cysts in the environment of the children resulted in isolation of cysts of *E. histolytica* from sand boxes and the wading pool as well as the finding of protozoan cysts and helminth ova under the finger nails of children and on garments which had been laundered in the institution.

Control of amebic infection was attempted in the orphanage by treatment of all infected children and all noninfected children over 2 years of age with diodoquin. Before treatment was begun, live steam was applied to floors, walls, and furniture in the dormitories and to other areas in order to destroy cysts of *E. histolytica.* Subsequent stool examinations indicated freedom from infection of all individuals.

Control of Fecal-Borne Parasites

Effect of sewage treatment on parasite cysts and ova.—Owing to the increasing use of sewage sludge as fertilizer, an investigation was instituted to determine whether unheated sludge could be employed for this purpose without involving danger in the transmission of parasitic diseases. Examinations of 26 samples of sludge obtained from various types of plants in 16 municipalities and 3 national parks in Arizona and California revealed the presence of but one single helminth ovum. In 75 samples of sludge obtained from 17 Army camps in 8 Southern States, eggs of parasitic helminths were isolated from 27, or about one-third of the samples. Ova of *Ascaris lumbricoides*, *Trichuris trichiura*, and *Hymenolepis sp.* were represented. Viable ova were found in samples obtained from all stages of treatment from raw sewage to the final dried product. A species of ameba morphologically similar to *Endamoeba histolytica* was found in sludge from digestion tanks and in an Imhoff tank. While more data are needed in connection with the possible presence of *E. histolytica* in sludge, the use of sludge as fertilizer may serve to disseminate ova of these intestinal parasites.

Effect of water chlorination on cysts of E. histolytica.—Experiments on the effect of various chlorine concentrations were carried out within an air temperature range of 21.1° C. and 30° C., with pH values near neutrality, and with nitrogen concentrations varying between 0.4 and 19.1 parts per million. Lethal effect of chlorine solutions was determined by ability of treated cysts to establish growth in cultures.

States Relations Division

(Division of Domestic Quarantine)

Assistant Surgeon General JOSEPH W. MOUNTIN in charge

On July 1, 1941, by direction of the Surgeon General, the name "States Relations Division" was adopted officially for the Public Health Service in place of the designation "Division of Domestic Quarantine." The functions of the division remained the same; namely, to prevent the interstate spread of communicable disease by the application of quarantine restrictions, and to aid the States in developing adequate State and local public health organizations through provision of technical consultation service and financial assistance under the terms of title VI of the Social Security Act.

The division was given responsibility for the administration of the emergency health and sanitation activities made necessary first by the defense program and, later, the war. This involved expansion and intensification of many customary activities, as well as assumption of many new duties by both central office and field personnel. To enable the Public Health Service to assist State and local health authorities in performing emergency tasks, or to furnish needed services directly when the States or communities were unable to do so, the Congress appropriated for the fiscal year a total of $4,470,000. Of this, $2,045,560 was allocated to general emergency health and sanitation activities, $2,142,860 to malaria control in war areas, $250,000 to industrial hygiene activities, and $31,500 to pay of commissioned officers.

Emergency Health and Sanitation Activities

At the request of the Federal Works Agency the Public Health Service undertook to investigate and determine the defense-connected need for all proposed health and sanitation projects, and to certify projects which could be constructed with propriety under the terms of the Lanham Act. These investigations, based on field inspections and reports, eliminated many projects not regarded as essential during the period of the emergency. The outbreak of war further emphasized the necessity of conserving vital materials, and the restrictions imposed by the War Production Board were promptly reflected by changes in design and construction which reduced to a minimum the use of such materials.

In urban areas, where the degree of community development permitted quick and economical use of public water supplies and sanitary sewers, the provision of such facilities was regarded as a basic requirement for good sanitation. During the fiscal year, 4,468 applications for Federal assistance under the terms of Public Law 137 were received by the Federal Works Agency. Of this number, 547 applications were for sewerage and 538 for construction and improvement of water supplies. Of these applications, 197 for sewerage and 215 for waterworks projects had been approved by the President at the end of the fiscal year. The estimated construction cost of the approved projects was $118,517,371.

In newly developed suburban and rural war areas where the cost of building sanitary sewers and central water supplies was considered excessive, a program was developed to provide more rudimentary types of essential facilities at minimum cost. This emergency program, which was put into operation in May 1942 with funds from the Lanham Act, provides for Federal financial assistance in the provision of small emergency water supplies, the construction and improvement of wells, the installation of sanitary privies and septic tanks, and the collection and disposal of garbage in areas where such measures are considered necessary. The projects are sponsored by counties and municipalities, and technical supervision is provided by State and local health departments. The Public Health Service assists in determining the areas in which the projects are to operate, in the preparation of the project applications, and in the technical supervision of the work. Less than 2 months after the inception of the program, 2 emergency sanitation projects were in operation in Texas, and applications were in process of preparation and approval for 20 additional projects in North Carolina, West Virginia, Maryland, Mississippi, Georgia, Alabama, Indiana, Kentucky, Illinois, Kansas, Missouri, Massachusetts, and Delaware.

Technical assistance was given to other Federal agencies concerned with the facilities construction program. Numerous interagency conferences were attended for the purpose of defining policies and procedures and coordinating activities. Assistance was given to the Power Branch of the War Production Board in the review of applications for priorities with regard to materials for waterworks and sewerage construction, and to the Bureau of Governmental Requirements of the War Production Board in the investigation of reports on special problems concerning priorities in the sanitation field. Aid was also given to the Chemical and Allied Products Branch of the War Production Board in the determination of chlorine requirements for sanitation purposes, especially with regard to water and sewage treatment and the use of chlorine in laundering.

A Hospital Facilities Section was established in the States Relations Division for the purpose of reviewing and certifying applications for Federal aid in the construction of hospitals, health centers, and related projects under the terms of the Lanham Act. During the year, 776 applications were received from communities by the Federal Works Agency. Of these, 427 were certified by the Surgeon General for approval. At the end of the fiscal year, 290 projects had been approved by the President and $49,303,168 had been allocated.

Actual construction of hospitals and health centers under the program proved to be discouragingly slow. Plans for most of the building were drawn before the outbreak of war and, therefore, called for the use of materials which later became unavailable for civilian use. It was necessary to redesign almost all the projects so as to conform to restrictions imposed by the War Production Board. In many instances in which the projects entailed additions to existing hospitals, it was extremely difficult to effect the necessary changes.

An architectural and planning unit was established in the Hospital Facilities Section. Making the necessary allowances for material shortages brought about by the war, this unit prepared a series of functional plans for four types of health centers to serve communities of various sizes. Cost estimates and equipment lists were prepared

for each of the centers. The plans and accompanying data were sent to all State health officers and to health officials in approximately 300 communities where the construction of health centers was contemplated.

When it became apparent that the conventional type of hospital construction would have to be abandoned for the duration of the war, plans for simplified types of construction were prepared for the use of the Federal Works Agency and local architects concerned with projects utilizing Federal funds. As a result, plans for 16 hospitals involving construction costs of $4,053,844 were studied and revised in accordance with emergency material requirements and acceptable standards of modern hospital practice.

The Hospital Facilities Section furnished consultation service to many other Federal agencies. Infirmaries were designed for war-worker dormitories to be erected by the Federal Public Housing Authority and recommendations were made concerning equipment and personnel needed. The Section was designated consultant to the Office of the Coordinator of Inter-American Affairs, and designed five 100-bed hospitals which are to be constructed in the Amazon River basin, as well as hospitals and health centers planned for other parts of South America. At the request of the Army Corps of Engineers, a 100-bed temporary hospital was designed to serve the proposed St. Lawrence seaway project in Massena, N. Y. Several large pavilion-type hospitals were designed for the Office of Civilian Defense to serve as evacuation hospitals outside of target areas in the event of enemy action. Preliminary plans were prepared at the request of the Department of the Interior for a 150-bed hospital in the Virgin Islands.

The Section also undertook to study fundamental hospital and health center problems. A comprehensive study on health centers was prepared and was published in The Architectural Record. Basic studies were completed on war-emergency hospital design, hospital delivery-room and maternity-service layouts, and standard space requirements for each of the service functions in general hospitals of various sizes.

Emergency Health and Sanitation Personnel

During the fiscal year 1942 requests for more than 2,000 professional workers were received by the Public Health Service from State and Territorial health agencies. The recruitment and assignment of Public Health Service personnel for emergency duty were continued within the limit of the funds available for the purpose. Recruits were given a 4-week orientation course in the policies of the Public Health Service and the problems they were likely to encounter in the field. They were then detailed to the district offices from whence they were loaned to State health officers who in turn assigned them to the communities where their services were most urgently needed. At the end of the fiscal year, approximately 700 persons had been assigned to emergency duty in 216 critical war areas in 42 States, 3 Territories, and the District of Columbia. On June 30, 1942, a total of 515 were on permanent field duty with local health agencies in war areas.

Typhus Fever Control

An Office of Typhus Fever Control was established in May 1942, with headquarters in Atlanta, Ga., for the purpose of assisting States in the development of adequate programs in more communities and

larger areas than those previously covered. Work was resumed on the experimental vent-stoppage project conducted in Savannah in collaboration with the Georgia State Department of Health. Control projects, based on modified ratproofing of buildings, were undertaken in cooperation with State and local health authorities in Hartsville, Orangeburg, and Sumter, S. C., and in Chattanooga, Tenn. In Louisiana, the State health department was assisted in instituting control measures in many small communities. In both Louisiana and Alabama, assistance was given to the State health departments in the fumigation of rat-infested premises with hydrocyanic gas. Extensive preliminary survey work, with a view to the institution of better control programs in Florida and Texas, was completed. At the request of Army authorities, several military establishments were visited, and advice was given concerning methods of rat control.

Malaria Control in War Areas

During the first 8 months of the fiscal year drainage and larvicidal mosquito control projects operated by the Work Projects Administration with technical and consultative assistance by the Public Health Service was severely curtailed because of a shortage of relief labor. However, heavy concentration of military and naval forces and war industries in areas where malaria is endemic made an effective control program imperative. On January 1, 1942, there were 150 critical military and war-industry areas in which malaria was known by the Public Health Service to constitute a definite health hazard. In February 1942, the Office of Malaria Control in War Areas was established with headquarters in Atlanta, Ga., to organize a control program which would utilize to the fullest extent the resources of the Work Projects Administration and the State health departments, but which would also involve direct operation by the Public Health Service when other resources were inadequate. The program was conducted mainly with personnel supplied by the Public Health Service. Control work outside military reservations was closely integrated with that carried on by the military authorities within the reservations. In industrial war areas the projects were operated entirely by the Service in collaboration with the States. Actual control operations were begun on March 17, 1942. By June 30, projects employing more than 2,600 men were in progress in 93 areas in 15 States, the District of Columbia, and Puerto Rico. These projects benefited 450 war establishments, including military, industrial, housing, and recreational installations, and affording protection to several million persons directly connected with the war effort. Approximately $1,400,000 were utilized for technical supervision of the Work Projects Administration program during the first 8 months of the year and for direct operation by the Service during the last quarter. From March 17 to June 30, 1942, nearly 300,000 gallons of larvicide were distributed over 21,000,000 feet of pooled ditches and 750,000,000 square feet of ponds. In addition, minor drainage operations removed the mosquito hazard from 5,000,000 feet of pooled streams and rendered 5,000,000 feet of such streams and 44,000,000 square feet of pond suitable for larvicidal operations.

Entomological studies were conducted in several additional areas so that control measures could be undertaken promptly if and when the

need was demonstrated. Plans were also developed for making thick-film blood indexes both inside and outside of the controlled areas in order to obtain accurate data on the incidence of malaria. To reduce the malaria hazard in rural areas outside the protected zones near each war establishment but within areas frequented by troops and war workers, an educational program of an experimental nature was undertaken. This program was supplemented by insecticidal destruction of house-frequenting *Anopheles quadrimaculatus* mosquitoes. A project for controlling production of *Aedes aegypti* mosquitoes was undertaken at Key West, Fla., at the request of the Navy. Plans for other projects of this type in Texas and South Carolina were also developed.

Dog Fly Control

In certain regions along the Gulf coast of Florida, production of *Stomoxys calcitrans*, commonly known as the stable fly or dog fly, is so prolific as to make human activity out of doors all but impossible during September and October. During the summer and fall of 1941, several Army flying fields were being constructed in the dog-fly areas, and Army authorities were fearful of the delay which would be experienced in construction and training activities if the larvae were allowed to hatch. The Public Health Service in cooperation with the Bureau of Entomology and Plant Quarantine of the Department of Agriculture applied larvicides to deposits of shoal and turtle grass along approximately 140 miles of seashore. A remarkable difference in the degree of infestation was soon apparent in the treated and untreated areas No serious interruption of either construction or training activities was experienced at the flying fields.

Plague Control

A report of the dangers inherent in the eastward spread of rodent plague was presented by the Surgeon General to the health officers of 12 Western States at a conference held in Salt Lake City in August 1941. A program was outlined for the institution of more active control measures by the several States and the Public Health Service.

A conference was held in Washington, D. C., in November 1941, with representatives of the Fish and Wildlife Service and other Federal agencies whose legal responsibilities might be affected by control measures adopted by the Public Health Service. An agreement was drawn up providing for cooperative working relationships.

The number of mobile laboratories utilized by the Public Health Service in making plague surveys was increased from 4 to 10. Personnel to operate the additional units were recruited and trained. Other units operated by the States carried on survey work in California, Idaho, Montana, Oregon, and Washington. Six Service units were engaged during the spring in making a survey from the Rio Grande River to the Canadian border between 100° and 105° longitude to determine the eastern limits to which infection had spread. Samples of all the wild rodents prevalent in this zone were collected and examined. Plague was found during the year among rodents inhabiting extensive areas in California, Oregon, Washington, Idaho, Montana, Colorado, New Mexico, and North Dakota. One fatal human case occurred in northern California. Surveys were made in the envi-

rons of nearly all the principal military establishments situated in the Western States. Particular attention was devoted to cantonments in or near locations where plague has been found in recent years. Four Service units were engaged in conducting surveys in and around the military reservations in the vicinity of Spokane, Wash., and at Camp Hunter Liggett in California.

During the year, 47,247 wild rodents and 30,954 urban rats were collected and examined. The State units collected 10,887 wild rodents. All bacteriologic and animal tests of rodents and their parasites collected by the plague-control field-survey units were examined at the Public Health Service Laboratory in San Francisco.

Tuberculosis Control

Experience during the last World War and the rise in the tuberculosis death rate in England since 1939 indicate that unless more adequate control measures are effected in the United States, this country may experience an increase in tuberculosis as a result of war-time conditions.

In January 1942 a Tuberculosis Control Section was established in the States Relations Division with funds allotted from emergency health and sanitation appropriations. The purpose of the section is to cooperate with the Division of Industrial Hygiene, National Institute of Health, in carrying out a tuberculosis control program including the following activities:

(1) Examination of United States Coast Guard recruits.
(2) Examination of workers in war industries.
(3) Examination of persons in war-industry communities.
(4) Development, in cooperation with the Selective Service System, the Navy and State health departments, of systems for reporting cases of young men rejected because of tuberculosis. Such systems would make it possible to take full advantage, from a public health point of view, of the excellent case-finding work done by the Army, Navy, and Coast Guard.
(5) Consultation service to State health departments in the development of control programs, especially with regard to the prevention of the rise in tuberculosis rates which, without adequate control measures, might be expected.

Chest X-ray examinations were found to be the best means available for mass case-finding surveys among adult groups. Because of low cost and a demonstrated relatively high degree of effectiveness, the 35 mm. photofluorographic X-ray process was selected for use by the section in its screening work. After the discovery of cases, either evident or suspected, by the small-film method, diagnosis is confirmed by reexamination with standard-size X-ray film.

Thirty-five millimeter units are loaned to State bureaus of industrial hygiene and bureaus of tuberculosis control for use in case-finding. Accompanying each unit are a medical officer, a technician, and a clerk. A unit is able to perform from 300 to 500 examinations a day, and double this number if an additional technician and clerk are provided. In developing a program in any community, the cooperation of State and local medical societies, management and labor representatives, and voluntary agencies is solicited in order to insure success of the program and appropriate therapeutic action for cases of tuberculosis discovered.

At the end of the fiscal year, one unit was in operation in North Carolina and another in Texas. A third unit was operating at the Curtis Bay Coast Guard Station at Baltimore, Md. Arrangements

had been completed for the placement of several additional units in critical areas as soon as equipment and personnel could be obtained.

Due to the limited funds available to the Public Health Service for this type of activity, every effort was made to encourage and assist State health departments in obtaining equipment and developing similar programs of their own. At the end of the fiscal year, assistance of this kind had been requested by, and given to nine States. Considerable increase in utilization of this relatively new and inexpensive method of case-finding is expected.

The unit assigned to San Antonio, Tex., is examining Mexican migratory workers and employees in war industries in this area where the tuberculosis death rate is known to be the highest in the United States. Of the first 10,000 Mexican workers examined, 3 percent showed evidence of advanced tuberculosis and 6 percent showed minimal or suspected pulmonary disease.

In June 1942, 1,314 officers and employes of the Public Health Service in Washington, D. C., were examined by the small-film technique. Several cases of tuberculosis, including an advanced case, were detected. Clinical diagnosis of tuberculosis was confirmed and attention was given to the persons needing care.

A survey of young men rejected by the armed forces because of tuberculosis, conducted by the section in March 1942, revealed the disturbing fact that the Army, Navy, and Coast Guard had no uniform procedures in operation for reporting cases of tuberculosis to State and local health departments when such cases were found at local boards and induction stations. The survey disclosed that in only 52 percent of the States were satisfactory reports received with regard to men rejected by the Selective Service System. Conferences were held with the medical staff of the Selective Service System and the subcommittee on tuberculosis of the National Research Council, which recommended prompt corrective measures. On May 21, 1942, the Selective Service System issued a regulation providing for establishment of a complete and satisfactory system of reporting. Satisfactory plans of reporting were also developed in cooperation with the Navy and the Coast Guard.

Food and Milk Sanitation

Food and milk sanitation presented problems of unusual magnitude because of wartime conditions. Through the district offices and the liaison officers every effort was made to assist both military and civilian health authorities in the maintenance of sanitary standards which would provide safeguards against food-borne infection. Overcrowded eating places, hastily constructed food and drink purveying establishments, difficulty in obtaining materials customarily required for approved sanitary equipment, and employment of substandard and untrained food handlers were all factors which increased hazards and made proper control more difficult. Special attention was given to cooperation with State health departments in the development of restaurant sanitation programs, and a series of regional seminars for the training of restaurant sanitarians was instituted in collaboration with the States. At the request of military and civilian authorities, investigations were conducted of food-borne disease outbreaks occurring in or near military posts and war-industry establishments.

Milk supplies in military and war-industry areas received special attention. Many areas which previously had served a few hundred people had suddenly to meet the needs of several thousand. Under such conditions, sanitary supervision of production and distribution became extremely difficult, and extraordinary precautions had to be taken. The reconnoissance surveys made by the Public Health Service indicated that improvement in milk and food sanitation was needed in 70 percent of the areas surveyed. Milk specialists were assigned to the three district offices in the continental United States which had not previously had such service. The district milk specialists cooperated with the Army, Navy, and State and local health departments in developing adequate supplies of safe milk for the use of soldiers, sailors, and war workers. They also assisted State and local authorities in the training of milk sanitarians.

Trailer laboratories assigned by the Public Health Service to maneuver and cantonment areas where laboratory facilities were lacking examined thousands of milk samples to determine whether or not they met the required standards. A Service bacteriologist surveyed milk laboratories in war areas throughout the country with a view to standardizing procedures; by June 30, 1942, more than 200 laboratories had been visited, including 8 Army Service Command laboratories.

The War Production Board was assisted in the establishment of priorities governing the manufacture of milk equipment and advice was given to the Office of Defense Transportation with regard to the conservation of milk delivery equipment. The Federal Specifications Executive Committee of the Treasury Department was aided in the revision of specifications for fresh milk. Lunchrooms and cafeterias in several temporary Federal office buildings erected in Washington were inspected and recommendations were made.

At the end of the fiscal year, the milk ordinance recommended by the Public Health Service for voluntary local adoption was in effect in 109 counties and 897 municipalities in 35 States. In addition, 10 States had laws or regulations based on the Public Health Service milk sanitation ordinance.

A compilation of reports submitted by State health departments, revealed that of the 340 food-, milk-, and water-borne outbreaks reported, 60 were traced to water supplies, 39 to milk and milk products, and 223 to other foods.

The restaurant sanitation manual recommended by the Public Health Service for voluntary local adoption, first issued in definitive form in June 1940, had been adopted in many communities located in 25 States by the end of the fiscal year 1942. The manual has been used as the basis for State regulations in 13 States and for local ordinances in 79 counties and 146 municipalities.

The Sanitation Section continued to administer the shellfish sanitation program which involves endorsement of approximately 2,000 certificates issued by State health departments. The "Shellfish Sanitation Code" and inspection forms for shellfish-producing areas and processing plants were completed. The code and forms are to be applied experimentally during the 1942–43 season in the Public Health Service districts where shellfish are produced. After the trial application, certain changes in the code may be necessary before it is distributed generally.

As a result of the bacteriological survey made to determine the safety of certain sections of Raritan Bay, the taking of oysters and hard clams was restricted in certain additional areas of New York and New Jersey. The New York State Supreme Court upheld the authority of the Conservation Commission by refusing a petition requesting that the restricting order be rescinded.

Public Health Nursing and Nursing Education

The work of the Nursing Section materially increased. One hundred and sixty-four qualified public health nurses were recruited for emergency duty in areas affected by war activities. These nurses were recruited mainly from large nonofficial public health nursing agencies. Nurses employed by official health agencies were not encouraged to file applications, although it was necessary to offer positions to those who on their own initiative field applications with the Civil Service Commission. A consultant was assigned on a full-time basis to serve as instructor in the orientation course given to all recruits. Much time was devoted to consultative assistance to various agencies concerned with war nursing service, notably the National and State Nursing Councils for War Service, the Health and Medical Committee of the Office of Defense Health and Welfare Services, and the Office of Civilian Defense. This cooperation resulted in a minimum duplication of effort and an integrated approach to such problems as the recruitment of nurses for duty with the armed services, the enrollment of additional nurses in schools of nursing, and the maintenance of civilian nursing care.

To help meet the critical shortage of nurses, the Congress, on July 1, 1941, appropriated $1,200,000 for the establishment of refresher courses for inactive registered nurses, for postgraduate courses in special fields of nursing, and for increasing enrollment of undergraduates in basic schools of nursing. A deficiency appropriation of $600,000 was secured to encourage schools of nursing to admit additional classes in June, or to advance the admission date for fall classes in order to accelerate the basic training program.

Funds were allotted by the Public Health Service directly to the participating schools for the following purposes: (1) Scholarship tuitions for qualified needy students; (2) additional instructors and instructive facilities commensurate with the increased student enrollment; (3) subsistence during that portion of the training course in which the student does not render appreciable service to the institution; and (4) expansion of clinical teaching facilities through affiliation of institutions.

To guide the Public Health Service in the administration of this program and to assist in the preparation of regulations governing the allotment of funds, the Surgeon General requested the subcommittee on nursing, Health and Medical Committee, Office of Defense Health and Welfare Services, to act as an advisory committee. In addition to the members of the subcommittee on nursing, three nursing education consultants were added to the advisory group.

During the fiscal year 1942, 73 schools of nursing established refresher courses for 2,300 inactive registered nurses who were willing to return to active service. Two hundred and fourteen schools of nursing participated in the undergraduate training program and in-

creased their enrollment of student nurses by 6,242 students. The increase in enrollment in these schools was approximately four times as great as the increase in the nonparticipating schools. The major portion of the appropriation was used for this type of program. Forty-four colleges and universities gave postgraduate preparation to 1,393 graduate nurses. A limited amount of the appropriation was used to provide special clinical training to graduate nurses in several fields, including obstetrics, midwifery, pediatrics, anesthesia, and surgery. In order to help meet the need for public health nurses in war areas, 24 colleges and universities provided training for 813 public health nurses. (See appendix C, table 1.)

National Inventory of Registered Nurses

The national inventory of registered nurses, undertaken at the request of the National Nursing Council for War Service and the subcommittee on nursing of the Health and Medical Committee, Office of Defense Health and Welfare Services, was completed. Through the cooperation of State nurses' associations, questionnaires were collected from almost 300,000 registered nurses. The information from the questionnaires was coded and placed on punch cards with the aid of Work Projects Administration personnel. The material was analyzed with regard to active or inactive status of the nurse, availability for service, type of work she is best fitted to do, and eligibility for military service. Each State was furnished a copy of the tabulations pertaining to its own nurses, and two progress reports were published. The work is being continued in order to secure full information on all new graduates each year.

Nursing Consultation Service to States

General consultation services in public health nursing were available to the States as in previous years, and special consultation services in venereal disease control and industrial hygiene were provided. While the public health nursing consultants assigned to the district offices continued to bear the major responsibility for this type of activity, special assistance was given them by the central office. The topic of nursing aspects of State merit systems was discussed during the year, as the shortage of qualified nursing personnel made necessary some provision for the temporary employment of less qualified workers during the emergency.

Annual Census of Public Health Nurses

The data for the 1941 census were collected by the public health nursing consultants assigned to the district offices and compiled in the central office. The census shows that a total of 21,123 public health nurses, exclusive of nurses employed by industries, were on duty on January 1, 1942. The census of nurses in industries was made part of a separate study. The distribution of public health nurses by type of employing agency is given. There are 782 counties, and 32 cities with a population of 10,000 or more, in which no public health nursing service of any type is available. Table 3 shows that 682 more public health nurses were employed on January 1, 1942 than on January 1, 1941. Local official agencies showed the greatest increase, and nonofficial agencies a slight decrease. Almost 6,000, or approximately 28 percent, of all public health nurses had complete a year or more of academic training in public health.

Financial Aid to States and Territories

Under the provisions of title VI of the Social Security Act, the sum of $11,000,000 was appropriated to enable the Public Health Service to make grants-in-aid to the States for the establishment and maintenance of State and local health services. During the year the total amount paid to States from title VI funds was $11,472,994.79. The amount in excess of $11,000,000 appropriated was paid from a reserve set up from the appropriation authorized during 1941.

The total amount of funds budgeted from all sources in the cooperative Federal-State public health program in the 48 States, 3 Territories, and the District of Columbia during the fiscal year 1942 was $118,843,415.21. This is an increase of $9,490,495.88, or 8.68 percent, over the amount budgeted during the fiscal year 1941. This increase does not necessarily represent additional funds available during the year for public health services, but rather the extension of the cooperative health program to include more local communities, with the result that these communities for the first time submitted their budgets to the Public Health Service

The distribution of funds from all sources budgeted by the States and Territories for various types of public health activities, as well as the ratio of title VI funds to total funds budgeted, are shown in table 5, appendix C.

Approximately 42 percent of title VI funds were budgeted for local health services, which include all types of health activities carried on at the local level of organization. Other activities listed in table 5 are carried on by the State health departments.

The amount of title VI funds budgeted for environmental sanitation was 9.2 percent of the total amount budgeted from the source, and represents the greatest proportional Federal financial participation in any one activity with the exception of local health services. The environmental sanitation item in table 5 includes State supervision of sewage disposal, water, milk, and food supplies, and rodent control activities. The $6,640,892 shown in table 5 to have been budgeted for institutional care includes the budgets of institutions operated by local political jurisdictions. In previous annual reports this item has included only institutional care at the State level. Consequently, the amount so designated in table 5 is much larger than the corresponding amounts reported in previous years.

Improved Methods of Business Management

Since 1937, the division has maintained a small auditing staff to examine the propriety of State expenditures under the terms of the grants-in-aid program. During the year arrangements were made to assign to each district office an administrative analyst specially qualified not only to audit grant-in-aid accounts but also to render consultation service to State health departments on a variety of fiscal and administrative problems related to the grants-in-aid program. A conference of the administrative analysts was held at which uniform auditing procedures and standard audit report schedules were developed and adopted.

In cooperation with the Committee on Business Management of the Conference of the U. S. Public Health Service with State and Territorial Health Officers, a simplified budgetary procedure was

formulated which became effective with the submission of State budgets for the fiscal year 1943. According to the new procedure, a State may choose one of four budget plans and one of two expenditure reporting plans. The various plans permit different degrees of administrative freedom, but the choice of plan and the extent to which the Public Health Service may properly relax its line-item control of budget revisions are governed by the adequacy of the State's fiscal controls, as determined after a careful survey by the administrative analyst of the Service's district office. It is expected that the new procedures will not only relieve the States of much clerical work involved in submitting financial documents to the Public Health Service, but that it will also result in an improvement of State accounting controls over expenditures of grant-in-aid funds.

In conjunction with the Children's Bureau, United States Department of Labor, a joint budget form was developed which might be used by the States in reporting to both the Children's Bureau and the Public Health Service. Use of the new form is to be tried experimentally in five States during the fiscal year 1943, with a view to reducing materially the amount of work involved in the preparation of annual budget requests to the two Federal agencies.

State Programs in the War Emergency

Comparison of the amounts shown in table 5, appendix C, with the corresponding amounts budgeted during the fiscal year ended June 30, 1941, indicates certain adjustments in State health department programs as a result of the war. For example, $1,545,909 was budgeted for supervision of local health services, an increase of $323,596, or 26.5 percent, over the amount so budgeted during the previous fiscal year. This increase represented mainly supervisory field activities necessary to safeguard war areas where local health facilities were inadequate. In providing additional field forces in these areas the States supplemented the emergency health and sanitation activities of the Public Health Service.

The demand for delayed birth certificates which occurred as a result of the requirement for proof of citizenship by employes in war industries was reflected by an increase of $997,121, or 48.8 percent, in the amount budgeted for vital statistics purposes. Dental hygiene budgets increased $164,139, or 23.9 percent. Dental health programs were conducted by 42 States and the District of Columbia, and at the end of the fiscal year 2 States were planning to initiate programs. In addition, State dental programs were aided through the authorization of Venereal Disease Control Act funds for use in providing limited dental care to venereal disease patients receiving treatment with heavy metals. Budgets for public health education increased $383,723, or 47.1 percent. The amount set aside for nutrition work cannot be compared with the sums so allocated in former years, because prior to 1942 nutrition activities were not reported separately. Nevertheless, it is interesting to note that $212,650 budgeted during 1942 can be directly identified with this type of activity.

While war-time needs served to stimulate activity in some fields, there were curtailments in others. For example, funds, budgeted for training purposes were $251,880, or 13.0 percent, less than during 1941. Although the number of State cancer programs in operation

was reduced from 20 to 17, the amount of funds budgeted for cancer control, including hospitalization, increased slightly.

Merit System of Personnel Administration

Progress was made in the establishment of merit systems of personnel administration for employees of State and local health departments. The entrance of many qualified persons into the armed services, however, made it increasingly difficult for health departments to find suitable personnel. In recognition of this difficulty, the Public Health Service formulated and sent to all State health officers and merit system supervisors certain suggestions for adapting merit systems to the emergency. These suggestions included an aggressive and continuous recruiting policy with regard to classes of personnel from whom relatively few applications are received; revision of compensation plans to provide a salary scale which would compare more favorably with remuneration offered in competing forms of employment; and establishment of interim classifications to permit temporary employment of personnel unable to meet existing standards.

Standard specifications for 17 classes of health department personnel were prepared. These were adopted by the Fortieth Annual Conference of the U. S. Public Health Service with State and Territorial Health Officers, and were furnished as guides to all State health officers and Public Health Service district offices. The merit system policies of the Service, as promulgated in 1941, were revised and the amended policies were circulated. Suggestions for reviewing classification and compensation plans, as well as check lists for use in such reviews, were also prepared.

By June 30, 1942, merit system rules and regulations had been received from 48 States, the District of Columbia, and the Territories of Alaska, Hawaii, and Puerto Rico. Many revisions of rules were also received. All rules and revisions submitted were reviewed to insure conformity with sound principles of merit system administration. On June 30, 1942, 7 single-agency rules had been submitted, but none accepted; 26 joint-agency rules had been submitted and 9 accepted; 19 civil service rules had been submitted and 4 accepted. While only 13 rules had been accepted as being in substantial conformity with the policies of the Service, 35 rules had been reviewed and suggestions for revision had been made. In many instances, the only condition lacking is formal action by State health officers or merit system councils.

Of the classification and compensation plans submitted by 42 States and 3 Territories, 2 had been accepted entirely. Progress has been slow because such plans are subjected to detailed review by the district offices before submittal to the State health officers.

Personnel Training

The program for training of State and local public health personnel was continued and 880 applications were approved by the district offices. This number was approximately 25 percent less than the approved applications received during the previous year. Of the approved applications received, 205, or 23.3 percent, were from physicians; 439, or 49.9 percent, from nurses; 176, or 20.0 percent, from sanitation personnel; and 60, or 6.8 percent, from other classes. Training financed by title VI funds was proposed in 706, or 80.2

percent, of the applications, while training financed by Veneral Disease Control Act funds was proposed in 174, or 19.8 percent.

Sanitary Regulation of Common Carriers

The district engineering staffs, in cooperation with the Sanitation Section, continued to enforce regulations providing for the safety of drinking and culinary water, milk and food supplies, and general sanitary facilities of common carriers operating in interstate traffic. Policies and technical procedures governing this work were formulated by the Sanitation Section in order that they might be uniform throughout the nine districts.

Inspection of dining cars and railway commissaries included supervision of milk supplies, shellfish, and other products, as well as of methods of storing, handling, and serving foods. During the year the Sanitation Manual for Land and Air Carriers Operating in Interstate Traffic was revised in accordance with conclusions reached at conferences held with representatives of the railroad, air, and bus transport industries.

Reciprocity of certification between this country and the Dominion if Canada was continued. Twenty-nine water sources in the United States used by Canadian carriers were certified to the Canadian health authorities, and 27 Canadian sources used by the United States carriers were certified by Canadian authorities.

The extensive war-time shipbuilding program of the United States Maritime Commission imposed a heavy task on the engineering staff of district 2, who reviewed all plans for water systems and inspected the hulls of all vessels constructed under the program. Certification by the Public Health Service is required by the Maritime Commission before it will accept a vessel.

Review and Control of Operations

The Statistical Section of the Division made several studies designed to furnish needed information and to further development of improved operating procedures. The work of the Philadelphia unit consisted chiefly of the transfer of material from basic records to punch cards.

Two reports on the location and movement of physicians in 1923 and in 1938 were completed. Five chapters of the third edition of Public Health Bulletin 184, "The Distribution of Health Services in the Structure of State Government," have been completed and published in Public Health Reports.

Conference with State and Territorial Health Officers

The Fortieth Annual Conference of the United States Public Health Service with State and Territorial health officers met in executive session in Washington, D. C., on March 25 and 26, 1942. Representatives from 48 States, the District of Columbia, and Alaska were present. The conference adopted reports of the Committees on Interstate and Foreign Quarantine, Health Programs, Personnel, Business Management, Federal-State Relations, and Venereal Disease Control.

Division of Venereal Diseases

Assistant Surgeon General RAYMOND A. VONDERLEHR in charge

During the fiscal year 1941–42, the Congress appropriated $8,750,000 for venereal disease control. This amount includes a supplemental appropriation of $2,500,000 made during the second half of the fiscal year in recognition of the need for greatly increased activities connected with the war effort. Of the total amount appropriated, $7,816,600, or 89.3 percent, was allotted to the States, the District of Columbia, Puerto Rico, the Virgin Islands, and Hawaii for the prevention, treatment, and control of venereal diseases; $1,727,500 was earmarked for cooperation with the armed forces and other war needs.

State and local funds budgeted for venereal disease control were only slightly increased over the previous fiscal year, totaling $6,984,-584.52. Funds provided by State and local sources have increased from 3.2 cents per capita in 1939 to 5.2 cents in 1942, a per capita increase of 62.5 percent. Federal funds during the same period increased from 1.7 cents per capita to 6.3 cents. A total of approximately $16,700,000 from Federal, State, local, and other sources was provided for venereal disease control during the fiscal year 1942.

Cooperation with State Health Departments

Many State health departments were hard pressed during the past year to provide adequate epidemiological and treatment facilities which would insure thorough investigation of contacts and provide treatment for persons infected with venereal diseases. Fifty-two Public Health Service officers and 20 nurses were assigned to State and local health departments to aid them in the development of venereal disease control programs. Four hundred and eighty workers were made available to the States through the epidemiological assistance projects.

Forty-six States now employ epidemiological workers; in 7 of these States, however, only part-time epidemiological workers are available. In all, the States reported a total of 7,775 epidemiological workers engaged in venereal disease activities. Of this number, 601 are full-time workers and 7,174 are part-time. The 601 full-time workers are either medical social workers or public health nurses assigned to venereal disease control; the part-time workers are for the most part public health nurses engaged in generalized work which includes venereal disease control.

Assistance projects were established in cooperation with State departments of health. Under this plan Federal war appointments were given to individuals who, although they lack professional training or the required experience, have proved that they can take over certain tasks in the venereal disease control program which previously were, for the most part, performed by professional staffs. Projects have been set up in 10 States, the District of Columbia, and in New York City and Chicago. Through these projects assistance is given the States and local health departments in their venereal disease control pro-

grams, particularly as they relate to the follow-up of infected Selective Service registrants and their exposed contacts, and in the investigation of contacts reported as the source of infection of military and industrial personnel.

Before being assigned to local health departments and clinics, lay workers were given short orientation courses to familiarize them with the venereal disease problem, the value of treatment, and their relation to the individual being followed up. Wherever lay workers have been assigned, epidemiological activities have increased and a greater percentage of infected registrants for Selective Service and their contacts have been investigated and brought under treatment. In 1 Southern State, 17 lay workers were largely responsible for discovering and bringing under treatment in a single month, 494 individuals previously unknown to be infected with venereal disease.

Current reports indicate that one-half of registrants with positive blood tests were either placed or found under treatment, as compared to about one-third of those examined from November 1, 1940, to June 30, 1941. While this indicates some improvement in epidemiological activities in connection with selectees, it also points to the fact that much more active follow-up work on this group is still necessary.

Progress in Syphilis Control

The number of venereal disease clinics increased during the fiscal year from 3,245 to 3,569, approximately 10 percent. Patients admitted to clinics for treatment of syphilis numbered 343,000, a slight increase over 1941. Serologic tests for syphilis totaled 20,500,000. Arsenical drugs for the treatment of syphilis distributed by State health departments continued to increase; a total of 8,727,964 doses of arsenicals were distributed to clinics and private physicians—an increase of nearly 7 percent over 1941.

The 1942 survey made by the committee on serodiagnostic tests for syphilis revealed that all but one of the State laboratories have attained a satisfactory level of efficiency in the performance of serologic tests.

The performance of routine serologic tests for syphilis under the Selective Training and Service Act of 1940 proved to be a case-finding procedure of outstanding importance. The examination of the first 2,000,000 men revealed the presence of syphilis in 45 selectees and volunteers per 1,000 tested. The rate (corrected for age, race, and residence) for the entire male population between the ages of 21 and 35 is 48 per 1,000; for whites it is 24 and for Negroes 272. The highest total rates were found in 5 Southern States, namely, Mississippi, Florida, South Carolina, Georgia, and Louisiana, all of these States having rates of 100 per 1,000 or over. The lowest rates, less than 10 per 1,000, were reported in New Hampshire, North Dakota, Wisconsin, Vermont, Utah, and Minnesota. Routine serologic tests for syphilis in 3 groups—expectant mothers, applicants for marriage licenses, and draftees—are now being performed at the rate of 6,184,000 annually and are revealing syphilis patients at the rate of 226,000 a year.

Progress in Gonorrhea Control

Increasing numbers of persons are seeking treatment for gonorrhea from authorized sources. The number of cases reported by clinics and physicians to health departments increased by 11 percent over

1941, while the number of patients admitted to clinics for treatment increased by nearly 24 percent. Diagnostic tests for gonorrhea increased nearly 12 percent over 1941.

A total of 13,800,000 tablets of sulfonamide drugs were distributed by State health departments during 1942 as compared to 7,200,000 during 1941, an increase of 91 percent. The decrease in the duration of treatment per patient has continued, as evidenced by a decrease of 3.6 percent in the average monthly patient load in clinics. During the same period, there has been an increase of 24 percent in the number of admissions for treatment.

War Activities

The efforts of the division have been directed at the prevention of venereal diseases among the armed forces and workers in war industries. Past experience has shown that a definite relationship exists between the incidence of venereal diseases in a civilian community and the number of new cases which develop among the armed forces in adjacent cantonments. It has, therefore, been considered extremely important to reduce to a minimum the number of infections occurring among civilians in every community.

The Public Health Service has strengthened State and local health departments, and has cooperated with the Army, Navy, State, and Territorial health departments in working out programs which have been put into effect in areas adjacent to military and naval stations and wherever there is heavy concentration of industrial workers.

Prostitution has continued to be a deterrent to more rapid progress in venereal disease control activities in many areas. The Public Health Service has cooperated with the American Social Hygiene Association and with the Division of Social Protection of the Office of Defense Health and Welfare Services in obtaining more active and practical suppressive measures. The May Act, which authorizes the Secretaries of War and/or Navy to designate areas adjacent to military and naval establishments wherein prostitution shall be prohibited, has been invoked in 2 areas which included 27 counties in Tennessee adjacent to Camp Bragg and 12 counties in North Carolina. Surveys made by the American Social Hygiene Association in both these areas since the invocation of the act indicate that commercial prostitution has been greatly reduced. Although the May Act has been invoked in only 2 areas, it has been helpful in stimulating local law enforcement in many communities throughout the Nation.

In February 1942, a venereal disease control officer was assigned to the Pan American Sanitary Bureau to cooperate with the Federal Health Department of Mexico in the improvement and expansion of venereal disease control activities on the Mexican side of the international border. Eight Mexican physicians were appointed by the Federal Health Department of Mexico to head local control programs. These physicians were given a short course of training in venereal disease control work at the Public Health Service Medical Center, Hot Springs National Park, Ark. Local government officials of the Mexican border communities have, with only two exceptions, cooperated in the development of venereal disease control activities.

Venereal Disease Research

Cooperative Research

The Division of Venereal Diseases has continued to cooperate with other agencies in research studies, limiting this work to research bearing directly on the war effort. Rapid appraisal studies on the effectiveness of sulfonamide compounds in the treatment of gonorrhea have been carried on, and studies of massive arsenotherapy are continuing.

Syphilis.—The 5-day method of treating syphilis has now been employed on over 1,600 patients. There were 5 deaths reported among the entire group of 1,600, presumably from toxic encephalitis, a case fatality rate of 0.3 percent. A study was completed of the case records of 968 patients with early syphilis, treated and observed in 13 hospitals. Clinical and serologic reports indicate that the percentage of treatment failures occurring among this group, followed for a period of from 6 months to 1 year, after a single course of massive dose therapy, will probably be between 5 and 15 percent when 1,200 milligrams of arsenoxide is used. Toxicologic manifestations among these intensively studied patients were mild and seldom interfered with the treatment schedule. Although the period of observation was too brief to permit final evaluation, a method of treatment which offers the possibility of eliminating the infection in 85 percent of early cases of syphilis, within such a short period of time, is sufficiently important to warrant continuation of the study.

The Syphilis Research Center at Johns Hopkins Hospital, under the direction of a commissioned officer of the United States Public Health Service, has continued its studies. One of these is a study of the complement-fixation test using spirochetal cultures as antigens. Progress in the development of this antigen was demonstrated at the recent Washington Serology Conference, at which the spirochetal complement-fixation test developed in this laboratory proved to be one of the most sensitive of the techniques evaluated. It was completely specific in the spinal fluids and gave only 2 false reactions in the examination of serums. Work is proceeding on the identification and possible purification of the reactive material in these suspensions.

Research on intensive treatment of early syphilis has been carried on in the Johns Hopkins laboratory since 1939. Animal studies on the toxicity and therapeutic efficacy of mapharsen, as modified by the method of administration, are now almost completed. The conclusions reached lead to the implication that early syphilis, and perhaps latent syphilis, could be treated safely and, in most cases, definitely cured by triweekly injections of mapharsen continued for 6, 8, or 10 weeks instead of 18 months. Clinical studies of these treatment schemes have been started and 60 clinics are now cooperating.

On the basis of these research studies on intensive arsenotherapy, the Subcommittee on Venereal Diseases of the National Research Council recommended to the War and Navy Departments a new treatment schedule for patients with early and latent syphilis. This schedule comprises the administration of 40 intravenous injections of mapharsen to an approximate total dosage of 2,400 milligrams and 16 intramuscular injections of bismuth, to be given over a 6-month period.

A 5-year search at the Johns Hopkins Research Center for new arsenoxides of possible use in the treatment of syphilis has led to the

discovery of an entire class of compounds of potential therapeutic utility which are uniformly low in toxicity. Several arsenoxides retain therapeutic activity exceeding that of mapharsen. Other researches include studies on the prophylaxis of syphilis and the mechanism of the toxic action of arsenicals and detoxifying agents.

Studies on rapid treatment of early syphilis have continued at Bellevue Hospital in New York. During the past year, 336 patients were added to the series, making a total of 805 who have been given rapid treatment and placed under observation. Since October 1940, the treatment has consisted of a combination of induced fever and massive doses of mapharsen administered over a period of 7 to 10 days. Follow-up work on 68 percent of these patients has been possible. Of 404 patients followed for 6 months or longer after treatment, 89 percent were reported to have shown favorable results. Serologic studies have continued in clinics in the Middle West on patients treated by the massive-dose intravenous method. Quantitative serologic studies are being carried out with the aim of evaluating serologically the 5-day treatment of syphilis.

Gonorrhea.—Rapid evaluation studies were carried out in cooperation with the American Neisserian Medical Society to determine the effectiveness of various sulfonamide drugs in the treatment of gonorrhea. The need for such a study arose from the introduction in rapid succession of a number of sulfonamide drugs in the treatment of gonorrhea. Conclusions reached were based on the result of examinations of over 2,400 cases submitted to the Public Health Service by a number of clinics and private physicians. Each patient was treated with 1 of the 4 sulfonamides—sulfadiazine, sulfathiazole, sulfapyridine, and sulfanilamide.

It was established that sulfathiazole was superior to sulfanilamide in efficacy and superior to sulfapyridine in safety. Sulfadiazine was shown to be equally as good, if not slightly better, than sulfathiazole in the treatment of gonorrhea in the male. Sulfadiazine appeared to be more rapid in action than sulfathiazole in producing apparent cures, but by the end of 3 weeks both drugs had produced equally effective results, and both demonstrated a low rate of toxic reactions.

Venereal Disease Research Laboratory, Staten Island, N. Y.

The activities of the Veneral Disease Research Laboratory at Staten Island, N. Y., were considerably accelerated during the fiscal year. Additional facilities made possible the development and expansion of the following activities: (1) Research in serology and bacteriology; (2) investigations in physical chemistry; (3) synthesis of chemotherapeutic compounds and their chemical and pharmacologic assay; and (4) studies in histochemistry, photophysics and electrophorosis.

The Washington Serology Conference.—Originating American serologists met in Washington on October 20, 1941, to evaluate new and modified tests for the serum diagnosis of syphilis. A temporary branch laboratory was set up in Washington and was in operation for 3 months. The laboratory was staffed largely by personnel from the Staten Island Laboratory. Nineteen author-serologists were present or represented at the conference, and carried out a total of 28 test procedures on 1,002 serum and 234 spinal fluid specimens. The nega-

tive specimen material was collected from patient donors, representing a fair cross-section of medical and surgical conditions, as well as normal individuals. The analysis proved the ability of a test procedure to detect the presence of the disease, as compared to other test procedures and as compared to the known syphilis status of the patient.

Prophylaxis in syphilis.—The search for an agent capable of preventing the primary invasion of the syphilis organism has been continued. The investigations have been carried out with virulent strains of the syphilis organism, using the rabbit as the experimental animal. No satisfactory agent has been produced. The list includes some representatives of the newer type of wetting agents, detergents, and other surface-active substances.

Serology.—The Staten Island Laboratory has cooperated with the 48 States and the District of Columbia in the conduct of studies designed to determine the efficiency with which serodiagnostic tests are carried out. Special instruction has been given to 28 trainees from State, municipal, and private laboratories. The annual serodiagnostic evaluation study, limited to State laboratories, was carried out.

Bacteriology.—Further work has been done in improving the sensitivity of the methods used for cultivation of the gonococcus-utilizing growth-promoting factors. Studies to determine an optimal culture technic for use in women have progressed. Studies are being pursued of the dehydrogenases of cultured spirochetes, using the vacuum-tube technic. Preliminary studies have been carried out on the respiration of gonococci, using the Warburg miscrorespirometer.

Chemistry of antigens.—Studies in the chemistry of the lipoidal substances which act as antigens in the tests for syphilis have been continued. The entire field has received considerable emphasis recently through the identification by Pangborn of the reactive principle. This, in turn, has prompted the investigation of the fractions of human serum which may be responsible for the positive findings.

Medical Center, Hot Springs National Park, Ark.

Two 4-week postgraduate training courses in the management of the venereal dseases were conducted and 65 certficates of attendance were awarded. In cooperation with the Pan American Sanitary Bureau, 8 Mexican physicians who were to be stationed along the international border received 6-weeks' instruction. The Medical Center participated in the National Serologic Evaluation and the Washington Serology Conference by contributing 6,876 specimens drawn from 121 local donors. Other activities are shown in Appendix C, table 19.

A study of the comparative toxicity of neoarsphenamine and sulfarsphenamine was undertaken. The records of patients treated from January 1940 to August 1941 have been reviewed and coded. Preliminary tabulations confirm the findings of the Cooperative Clinical Group in 1933 that sulpharsphenamine was a more toxic drug than either arsphenamine or neoarsphenamine.

Venereal Disease Control in Industry

Since 1939, the Division of Venereal Diseases has carried on an active program of cooperation with the United States Civil Service

Commission, as employer for the Federal Government, and with private industry. These efforts have brought about improvement and expansion of venereal disease control activities among employees.

An employment policy consistent with modern scientific knowledge of the venereal diseases is the foundation of a program for venereal disease control in industry. Owing to the recognized influence of the United States Civil Service Commission upon employment policies in private industry, it became apparent that a venereal disease control program, embodying modern employment practices, and cooperation between the Commission and the Public Health Service, would have far-reaching benefits for the national program.

On January 17, 1939, the Commission issued a circular letter, Medical Series No. 18, which provided for the shortening of the 5-year period to 2 years and for consultation with the Division of Venereal Diseases in regard to physical eligibility of applicants with syphilis. Since then, files of all applicants have been forwarded to the Public Health Service for review and for such special examinations as may be desirable. An opinion is then given in regard to each applicant's physical eligibility for employment. The opinion includes a statement certifying employability with respect to: (1) Noninfectiousness; (2) ability to perform efficiently the duties of the position applied for, without endangering fellow-workers; and (3) industrial and retirement risk.

In June 1940 authority was given by the Commission for temporary appointment of persons not able to meet the full physical requirements for probational appointment. Under this status, an employee is not eligible for disability or retirement benefits. The Commission is willing to accept applicants on this basis when they can be certified as noninfectious, even though this may be contingent upon further treatment.

In 1942 the Commission further modified the regulations in regard to applicants with syphilis for employment under the newly created classification of War Service Appointment. Applicants with syphilis who can establish a record of 2-years' adequate treatment and who are noninfectious and capable of performing their duties without endangering their fellow workers, can be appointed without further question, if the appointing officer has assured himself of the above requirements. Those persons who have had inadequate treatment and are not a hazard to themselves or fellow workers may be accepted for appointment while still under medical care. Subsequent to entrance on duty, the applicant undergoes a complete investigation by the Medical Division of the Commission and the Public Health Service. When the applicant becomes uncooperative by failing to obtain proper treatment, this fact is reported to the Commission.

In order to promote the utilization of all available manpower, including persons with a venereal disease, the Division has intensified its efforts to implement the program of venereal disease control among industrial workers, through authoritative recommendations by a group of qualified experts.

On June 20, 1941, the Subcommittee on Industrial Health and Medicine of the Health and Medical Committee, Office of Defense Health and Welfare Services, was asked to consider the problem of venereal disease control in industry. The subcommittee recommended

that a special committee, composed of medical personnel, be appointed to help promote this program. Subsequently, in June 1942, an Advisory Committee to the Public Health Service was appointed by the Surgeon General. This committee was charged with the responsibility of studying the problem and making recommendations for a program to be sponsored by State and local health departments.

Morbidity Reporting

Statistical reports submitted by clinics, physicians, and State health departments showed that there were 489,172 cases of syphilis and 220,432 cases of gonorrhea reported to State and territorial health departments during the year. Admissions to clinic service for the treatment of syphilis totaled 343,312 and for gonorrhea 104,421. The average monthly patient load in clinics for syphilis was 400,198 and for gonorrhea 25,536. The total number of treatments administered in clinics for syphilis was 10,682,137, and for gonorrhea 801,267. (See appendix C, Table 15.)

Table 18 (appendix C) showing annual rates of venereal diseases in 44 cities of 200,000 population or over, prepared from reports submitted by city health departments, indicates that Memphis heads the list with a rate of 26.4 syphilis cases and 9.8 gonorrhea cases per 1,000 population.

Educational and Informational Activities

Informational and educational activities have been redirected to meet wartime demands. A consultation and advisory service was established to assist the States, the War and Navy Departments, and other governmental agencies.

To evaluate the effectiveness of venereal disease educational media, a 3-year study was initiated by the North Carolina State Board of Health and the Division of Venereal Diseases; in cooperation with the Z. Smith Reynolds Fund.

A 32-page illustrated pamphlet, *Victory* vs *VD*, has been issued in cooperation with the Office of Defense Health and Welfare Services. A VD War Letter reaches all Army and Navy medical personnel concerned with venereal disease control, as well as State, Territorial, county, and city health officers.

The core of the medical informative program continued to be the monthly scientific journal, *Venereal Disease Information.* This publication contains each month several original articles and research papers in the fields of diagnosis, treatment, research, and control methods. It also summarizes in abstract form the important current scientific and other papers dealing with venereal diseases which appear in publications throughout the world. Subscriptions to *Venereal Disease Information* for 1941–42 numbered 13,057, with a total average monthly distribution of 19,232.

St. Elizabeths Hospital

WINFRED OVERHOLSER, M. D., Superintendent

The health of the patients has been held at a high level and no epidemics or other catastrophes have occurred. The physical plant has been developed and maintained in an excellent state of repair; administrative changes designed to improve the care of the patients have been carried out; and the teaching and research programs have been continued.

The number of admissions has increased materially, as shown in detailed statements in this report. To provide the increased number of beds that will be needed for service men, the President issued Executive Order No. 9079, on February 26, 1942, authorizing the admission of certain classes of patients to the Public Health Service Hospital at Fort Worth, Tex., and the transfer of similar classes of patients receiving treatment in St. Elizabeths Hospital.

War priorities have been placed on many of the supplies and materials required for the operation of St. Elizabeths Hospital; there has been particular difficulty in securing supplies for the expansion of the power, heat and lighting plant (boiler and turbo-generator), the storehouse and shop building, and the two continuous treatment buildings. More recently, it has become difficult to obtain even such items as food and medical supplies.

Movement of Population

The total number of patients under treatment was 8,680 as compared with 8,038 in the preceding year. On June 30, 1942, the number of patients remaining in the hospital was 6,775 as compared with 6,883 on June 30, 1941. The decrease is due to the transfer of 400 patients to the United States Public Health Service Hospital at Fort Worth, Tex., and the admission of 175 beneficiaries of the United States Navy to that hospital without going through St. Elizabeths Hospital first.

The total number of admissions was 1,797 as compared with 1,503 the preceding year. With the exception of the year 1919, following the World War, when 1,802 patients were admitted, this is the largest number of admissions recorded in the history of the hospital. This was, however, before the Veterans' Administration Hospitals (War Risk Hospitals) were opened. Of the patients admitted, 113 were former patients of St. Elizabeths Hospital, and 177 others were former patients of other mental hospitals; 290 of the patients had had previous hospitalization.

The number of discharges was 1,534 as compared with 773 in the preceding year. Of the patients discharged, 400 were transferred to the United States Public Health Service Hospital at Fort Worth, Tex., but even without this added number, 1,134 were discharged.

The total number of deaths was 371 as compared with 382 in the preceding year. The total number of discharges and deaths combined was 1,905 compared with 1,155 in the previous year, or an increase of 750. The average daily patient population was 6,994 as compared with 6,663 in the previous year. This does not include patients admitted directly to the Forth Worth Hospital.

Medical Department

The pressure of routine administrative duties has increased in proportion to the number of admissions and population. New patients demand more attention and relatives are more solicitious than in chronic cases. Considerable time was devoted to the transfer of 400 patients to the United States Public Health Service Hospital at Fort Worth, Tex. The transfer of these 400 patients was accomplished in a remarkably short period of time without serious event.

During the year, 335 patients were presented at general conference, 169 of these being discharged. In addition, 281 patients were discharged while on elopement or visits. The discharge rate (exclusive of transfers to Fort Worth) in relation to the admission rate was 63.1 percent. Of the 1,797 admissions, 1,009 were white males, reflecting the increase of service patients.

Several hundred patients on the rolls of Walter Reed Hospital were cared for at St. Elizabeths Hospital temporarily until the opening of the new psychiatric building there in October 1941. The increase of service cases added to the already heavy work of the Men's Receiving Service. The Navy physicians being trained at St. Elizabeths Hospital proved of invaluable assistance to this service as well as elsewhere in the hospital, offsetting the amount of time required from the hospital staff for their training.

Staff physicians have continued to give time to court work and the preparation of returns to writs of habeas corpus. Staff members have examined Civil Service employees and District of Columbia prisoners for the courts and the District Attorney, and some employees of other governmental departments. Several staff physicians have been serving as psychiatric consultants to the Army Induction Board at Fort Myer. There is a demand for additional teaching time because of the accelerated curriculum in both the George Washington University and the Georgetown University medical schools.

Thirty enlisted men of the Navy Hospital Corps were assigned to St. Elizabeths Hospital for a training period of 3 months early in 1942, and 40 more on June 1, 1942. These men rendered valuable assistance to the ward services where the shortage of personnel might have created a serious situation.

The large increase in the number of patients admitted and discharged required frequent transfers from the receiving buildings to other services. The case of each patient was considered with a view to finding the most suitable place for him, aiming to preclude any complaints on the part of the patients or their relatives because of such transfer. Owing to crowded conditions, it has frequently been necessary to make two or three moves in order to find the proper ward for a given patient.

Every effort has been made to reduce the number of injuries. All reports of injuries from the various services were carefully checked and discussed with the physician-in-charge. Action was taken wherever possible to prevent recurrence. Special efforts were made to reduce the number of seclusions and restraints to a minimum. Restraint is practically never used except in Howard Hall, but even there, seldom are more than three or four patients in restraint.

The "beauty parlors" in the various women's services continue to be exceedingly popular with the patients and have had a decidedly beneficial therapeutic effect on many of them. In the Women's Receiving Service, 13,372 treatments have been given to the patients.

Medical and Surgical Service

During the year, 2,064 patients were admitted to the Medical and Surgical Service. This is a decrease of 159 admissions from the previous year. There was a moderate drop in the number of clinic visits, the number for 1942 being 44,787, and for the previous year 45,670. The medical and surgical wards alone provided 46,969 patient-days of care during the year as compared to 46,777 patient-days in 1941. The average duration of hospitalization in the Medical and Surgical Service for the fiscal year was 23.7 days per patient, and for the previous year 22.4.

The plan of internship was changed by necessity from a 2-year to a 1-year schedule. Although definite assignments and hours of duty are contemplated under the new schedule, it is anticipated that assignments will have to be made on a month-to-month basis because of the uncertainty of the military status of practically every intern. At the request of the Office of Civilian Defense, an Emergency Medical Unit was organized. Equipment for first-aid medical and surgical procedures was provided with the understanding that the Office of Civilian Defense would reimburse the hospital. Three emergency operating teams were organized.

During October 1942, the Anti-Luetic Clinic participated in a project of the Public Health Service to establish the relative accuracy of various serologic tests. An extensive collection was furnished of blood and spinal-fluid specimens from a large number of patients suffering from various pathologies, including syphilis, cancer, tuberculosis, and diabetes.

A blood plasma bank was established in January 1942, and has been put into use satisfactorily. Blood has been donated by various employees and competent patients. The fever cabinet has been in routine operation. One of the hospital nurses received special training at Garfield Hospital, and has been engaged almost solely in this activity.

The work of the department of clinical psychiatry continues to increase. The psychologists have made 463 psychological examinations and 473 individual tests. These individual tests were as follows: Stanford-Binet, 175; Bellevue, 130; Rorschach, 120; Thematic apperception, 8; Kent, 19; and miscellaneous, 21.

The department of psychodrama, formerly conducted by a volunteer worker, has been taken over by the hospital, and during the year there were 127 sessions with 91 patients. Of these, 40 were discharged from the hospital, 3 were transferred, and 3 were paroled.

Members of both the clinical and laboratory staff have taken part in research work. Research activities included the following:

1. Analyses of minerals (Na, K, Ca, Mg, Inorganic P, Cl), glucose and gases in arterial and venous blood in schizophrenic patients and in normal controls;

2. Analyses of blood constituents before and after electrical shock treatment;
3. Liver function test (Hippuric acid elimination) in schizophrenic patients;
4. Effect of hypnosis on the gastric secretion and blood sugar;
5. Brain wave changes following intravenous injection of sodium amytal in mute patients;
6. Cycloscopic analyses of brain waves.
7. Brain waves in schizophrenic patients;
8. Brain waves in narcolepsy.
9. Effect of hypnosis on the brain waves;
10. The effect of sulfanilamide on the brain waves;
11. Serial electroencephalograms;
12. Neocerebellar hemiagenesis;
13. Cysticercosis of the central nervous system;
14. Fatal cerebrovascular accident on a schizophrenic catatonic patient;
15. Concepts of dementia praecox;
16. Experimental production of sarcomas in chicks;
17. A rapid method for the differentiation of nerve cells;
18. Studies on the cultivation of *Endamoeba Histolytica;*
19. Survival of red blood cells including work on carbonic anhydrase.

School of Nursing.—Ninety-two student nurses and 44 affiliate students were enrolled during the fiscal year 1942. The Nurses Examining Board of the District of Columbia made regular inspections. Reports have been satisfactory. Grades made by St. Elizabeths graduates in the Board examinations have been consistently superior. The nursing service was decentralized in June 1942, and each service is now responsible for the direct supervision and administration of the various ward employees.

Social service.—The total number of patients supervised by the social service was 473. One hundred and seventy-six histories were obtained and service was rendered to 345 in-patients; 267 visits were made for the purpose of surveys preparatory to the contemplated release of patients.

Out-patient service.—With the generous support of Mrs. Anne Archbold, a member of the Board of Visitors, an out-patient department was established on an informal basis. Many of the medical officers have volunteered to staff such a psychiatric follow-up clinic in their hours off duty. The lack of an out-patient department has been the only respect in which the hospital has failed to meet requirements set by the American Psychiatric Association. Statutory authority for this activity is hoped for and an out-patient department for neurosyphilis cases is worthy of consideration. Establishment of these services would make possible a more liberal policy with regard to the release of patients and might result in an actual saving to the District of Columbia.

Occupational Therapy.—At Christmas-time, 1,391 gifts, made by patients as part of their treatment, were selected, individually wrapped in holiday paper, name-tagged, and distributed to the wards. Tarlatan bags were made and packed with candy, fruit, nuts, and chewing gum and were distributed to 2,412 patients. An additional worker was added to the staff as a recreational and musical-therapy aide. Treatments were given to 486 patients each month.

Libraries.—The medical library purchased 74 books and received 308 as gifts, making a total of 11,514 volumes in that library. Pamphlets, including reprints and annual reports, totaled 6,000. The library acquired 925 volumes for patients; of these, 131 were books

purchased by the hospital and the rest were donations. The total number of books in the library was 20,067. An average of 20 patients daily assist in the library work; in the patients' bindery, 497 books were repaired or bound. Approximately 4,600 books per month are circulated among patients. Book reviews for patients were conducted by the library on Saturday mornings, both parole and non-parole patients attending.

Administrative Department

Supplies.—The supplies produced on the hospital reservation, farm, and garden included large quantities of milk, pork, chicken, and vegetables, fruit, hay, and fodder. Shoes, belts, and suspenders were produced in the shoe shop. Mattresses, brooms, and brushes were manufactured. The bakery and laundry continued to function efficiently, and in the sewing rooms and occupational therapy departments large amounts of clothing for men and women were made. Many items were repaired in the various shops. All the steam, electricity, ice, and refrigeration used on the reservation was manufactured by the hospital.

The land known as Stevens Farm, located in Congress Heights, has been taken over by the National Capital Park and Planning Commission, a good part of it for the immediate use of the War Department. The hospital is to be allowed to farm any portion that is not required for immediate use. The erection of the two new continuous treatment buildings takes from the farm about 7 acres more of land ordinarily used for silage corn. The Navy Department has erected a naval radio station on four acres near the hospital cemetery. The acreage for growing of corn silage has thus been reduced by about 36 acres during the year. A rearrangement of the general farm plan was necessary to adjust the rotation of crops to meet the new conditions.

Personnel.—The total number of employees on June 30, 1942, was 2,054, an increase of 41 over the prior year. There were 760 appointments during the year, and 719 separations. On June 30, 1942, 110 employees were on furlough status, having entered the military and naval services; 77 employees were transferred to other branches of the Government service during the year; and 24 employees were retired. An 8-hour day was established, beginning January 26, 1942, for those employees who heretofore had worked 7 hours each day.

Purchases.—Supplies amounting to $2,670,965 were ordered, of which $1,547,722 were in formal contracts (over $100). These contracts included the construction of two continuous treatment buildings at a cost of $854,000, and the remodeling of the power plant at a cost of $259,000. The total number of contracts let was 311.

Financial office.—During the year disbursements approved by the financial office amounted to $4,925,705, on a total of 3,630 vouchers. Collections received and deposited amounted to $3,508,512. There were 3,354 purchase orders posted and passed through the accounting office; 5,776 bills from vendors, checked prior to vouchering; 15,200 job orders priced; 10,720 items collected; 506 deposits made in the Treasury; 1,746 vouchers prepared for withdrawals from patients' ac-

counts; 726 vouchers paid in cash by agent-cashier; and 40,379 postings made to individual patients' accounts.

Fire department.—Regular inspections are made by officers of the District of Columbia Fire Department, and occasional inspections are made by the fire marshal's office. Inspections include stairways, fire escapes, basements, hose cabinets, attics, and the grounds in general. The property damage from fire during the year amounted to $55. The approximate loss from fires from June 1917 to June 1942 was $36,669, an average of $1,467 a year. Additional Burrell All-Service gas masks have been obtained and distributed through the hospital. All fire equipment has been well maintained, and all necessary precautionary measures have been taken. The fire department participated in all black-out tests and drills.

Air raid warden.—The air raid warden service was established in December 1941, with headquarters in the fire engine house. Arrangements have been made for notifying department heads in case of air raid, and ambulance service has been provided. All necessary equipment for incendiary-extinguishing purposes has been installed and proper black-out precautions have been taken. Air raid drills have been held and procedure improved.

Construction work.—The fourth floor of the center building has been renovated for use as interns' quarters and the third floor of Howard Hall to serve as a dormitory for patients. Work has been done on roads and walks, and other necessary repairs and installations have been made where needed.

Culinary department.—The war shortage of certain food supplies required the changing of all menus, the method of preparation and handling and serving of the various meals. The increased cost of raw foods necessitated an increase in the price of meals furnished in the employees' cafeteria. The total number of meals served in the employees' cafeteria during the year was 232,844; total receipts were $73,725. A 45-hour course in dietetics—15 of lectures and 30 of laboratory work—has been given to a student group of 37 with the assistance of the dietitians.

New Legislation

New legislation was enacted by Congress to permit the Administrator of the Federal Security Agency to accept gifts for St. Elizabeths Hospital, and to provide for the administration of such gifts. Legislation was enacted, providing for the admission to St. Elizabeths Hospital of insane persons belonging to the Foreign Service of the United States.

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ANNUAL REPORT, 1943

Office of the Surgeon General

Medical Director WARREN F. DRAPER, Assistant to the Surgeon General
Medical Director L. R. THOMPSON, Chief Inspection Officer

THE SPECIFIC administrative activities of the Office of the Surgeon General continued to expand during the fiscal year.

Two important pieces of legislation affecting the Public Health Service were enacted. In the First Deficiency Appropriation Act of 1943, temporary promotions were authorized for commissioned officers of the regular corps. The law provided that:

> During the existing war, and for six months thereafter, any commissioned officer of the regular corps of the Public Health Service may be appointed to a higher temporary grade with the pay and allowances thereof without vacating his permanent appointment.

Boards of officers were convened to recommend such promotions. According to the regulations promulgated, those eligible for promotion are (1) all officers in the grades of passed assistant surgeon and surgeon, who have records of meritorious service and who have completed or hereafter shall have completed, 8 and 17 years of service respectively; and (2) other officers on certain special assignments, including assignments with the Army, Navy, Coast Guard, or outside the continental United States at the time of Pearl Harbor or thereafter.

The Bolton Nurse Training Act, signed by the President on June 15, 1943, provided for the training of nurses for the armed forces, governmental and civilian hospitals, health agencies, and war industries, through grants to schools of nursing. Under the program authorized by the act, the usual training period is accelerated from 36 months to 24 or 30 months. Funds will be allotted to participating schools of nursing to cover the maintenance, tuition, fees, and monthly stipends for first- and second-year students. Maintenance is provided for third-year students who will be paid monthly stipends by the institution employing their services in supervised ward duty. Outdoor uniforms are provided for all students who enroll in the United States Cadet Nurse Corps. The act also provides for the continuation of the postgraduate training and refresher courses which were included in the programs of 1941 and 1942.

The Public Health Service continued to assign liasion officers to the 10 Army Service Commands and to the Military Department of Puerto Rico.

District Offices

The duties and responsibilities of the nine district offices increased tremendously throughout the fiscal year. The critical wartime prob-

lems, common to all districts, have been housing, sanitation, shortage of medical and hospital facilities, training and provision of technical personnel, and services to military and civilian authorities in the performance of added duties connected with the war effort.

Industrial expansion plus the establishment of large numbers of military cantonments in certain areas placed a heavy burden on State health departments. In district No. 3, for example, it is estimated that 55 percent of the total war contracts let to date are located in States in that district, with Michigan and Ohio leading. In district No. 9, Texas has been most affected by the shifting and concentration of populations. Health programs in these and other States, none of which has been left unaffected by the war effort, have been reorganized to meet critical needs, while less essential activities were necessarily sacrificed. Trained personnel were transferred to more essential work in strategic areas; there was a marked increase in the number of doctors, engineers, nurses, and laboratory technicians assigned by the Public Health Service to the States.

Transmigration affects not only the larger cities but many rural areas as the result of the construction of large war industrial plants in relatively small towns and villages ill-equipped to cope with the health problems with which they are suddenly confronted. Military encampments near small towns also create problems, particularly with regard to venereal disease control. It has been the constant aim of the district offices to help State and local health departments to hold the line and to assist them in the expansion of health services wherever they were most needed. Cooperative activities with other interested Federal agencies, with official and voluntary health groups, social welfare agencies and educational organizations have been continued at an accelerated pace.

The district offices have continued to make surveys and resurveys in connection with applications for community health and hospital facilities. Projects have been investigated for the War Production Board to determine the need for critical materials, and supervision has been assumed of the Federal Public Housing Authority infirmaries. In cooperation with the Procurement and Assignment Service of the War Manpower Commission, surveys were undertaken to determine the medical care needs in war-industrial and extra-military areas. Every effort has been made to meet pressing demands for medical and technical personnel in areas where shortages are greatest.

Expanded activities of the United States Coast Guard have called for an unprecedented number of environmental sanitation surveys at Coast Guard stations, and the acceleration of the shipbuilding program has required unusual activity in connection with the approval of plans and inspection of vessels constructed by the United States Maritime Commission.

From November 1942 to April 1943 district office No. 5 assumed the responsibility for the provision of medical care for all Japanese evacuees from Hawaii from the time their ships docked at San Francisco until they were turned over to authorities at war relocation centers. Groups of approximately 500 arrived at monthly intervals throughout the period. Other civilian evacuees from the Pacific war areas were first hospitalized at private institutions, then at the San Francisco Marine Hospital, until they could be transferred inland.

In district No. 1, evacuees from the Orient and Europe, arriving at the Port of New York, were furnished medical and hospital care. At the request of the New York State Health Department refugee physicians were interviewed with a view to their employment on the staffs of venereal disease clinics. The district office cooperated with the National Committee for the Relocation of Foreign Physicians with a view to using such physicians in areas where additional medical personnel is needed.

The district offices continued to encourage cooperation between the military authorities, civilian health authorities, and the protective services in venereal disease control activities in extra-military areas with gratifying results. District No. 6, however, reports that the venereal disease control program of the Insular Health Department in Puerto Rico suffered from changes in administration, loss of personnel, inability to obtain drugs, and other unsatisfactory conditions. The 50-bed hospital for venereally infected women at Aguadilla was increased to 300 beds, but unfortunately this hospital, as well as the one at Caguas, is inadequately staffed. Vigorous venereal disease control activities on the part of the Army and Navy were reflected in a lowering of venereal disease rates during the latter part of the year.

Districts in which malaria control activities are being carried out report satisfactory results. In Puerto Rico the program concerned with the civilian population has not been good, but, as the result of excellent cooperation between the Public Health Service and the military services, the malaria rate among military personnel was reduced from 114 per 10,000 in July 1942 to 8 in May 1943. While there were no epidemics of any kind in the Virgin Islands, three officers of the National Institute of Health were detailed to study an outbreak of jaundice following yellow fever vaccinations of 11,000 persons.

In May 1943 serious flood conditions in Indiana and Illinois required extra services on the part of district No. 3 personnel. It was necessary to call to duty officers of the Public Health Service who hold inactive reserve commissions.

Medical and clerical personnel of district No. 4 were called on for service in the emergency created at the United States Marine Hospital at New Orleans, La., by the admission of an unusually large number of merchant seamen injured as a result of enemy action. The district office also made a special investigation of the circumstances under which polluted Mississippi River water was pumped by a United States Army transport into water supply systems of several wharves at New Orleans, La., causing an outbreak of diarrhea and dysentery.

In reporting medical and other personnel shortages, district officers stress the fact that, shortages, acute in many areas at the present time, are expected to become more critical during the fiscal year 1944.

Emergency Medical Section

The Emergency Medical Section continued to service the medical program of the Office of Civilian Defense. On June 30, 1943, 945 physicians had been granted commissions in the inactive reserve corps of the Service to staff the affiliated medical units in civilian hospitals which are to be available for active duty in the event of an emergency in the respective localities.

Claims were made for payment of medical services for 1,166 civilian defense workers, evacuees from combat zones, and repatriated citizens of the United States. At the close of the fiscal year only 58 claims had been disallowed.

The program for the establishment of blood plasma banks in civilian hospitals has become an important Nation-wide medical service. At the close of the fiscal year 158,290 units of plasma were available in hospitals and reserve depots in 316 communities in the United States and at strategic points in Alaska and Puerto Rico. Of this amount, 79,500 units were provided by the Public Health Service and 78,790 were pledged by the participating hospitals.

Emergency use of the plasma reserves was responsible for the saving of lives in such disasters as the Boston Cocoanut Grove Night Club fire, the wreck of the Congressional Limited at Philadelphia, Pa., and explosions, fires, and crashes at war plants.

The program has also greatly stimulated the education of physicians in the use of plasma for the treatment of surgical shock and other conditions where it is indicated. No serious reactions have been reported from the administration of plasma supplied by the Public Health Service or from the withdrawal of blood from donors. Minor reactions occurred in less than 1 percent of the administrations. At least 8,000 units have been used in disasters and routine hospital practice, of which only about 1,200 units were obtained from outside sources. At least 55,000 donors have been bled by the hospitals.

Chief Clerk's Office

The regular congressional appropriation for printing and binding for the year was $156,885; however, the amount actually available for incumbrance was $138,225. The reduction was due to the establishment by the Budget Bureau of a reserve amounting to $18,660.

Funds expended for stationery supplies amounted to $58,046.51. Miscellaneous supplies, services, and equipment cost $129,456.07. Shipments of stationery and printed forms to field stations averaged 200 per month. Requisitions for mimeographing, multilithing, and photostating totaled 2,257. The number of pieces of incoming mail and telegrams totaled 922,076 and outgoing correspondence, 402,754.

The efficiency rating system was applied to approximately 11,000 employees, both departmental and field. All ratings were submitted to the Public Health Service Efficiency Rating Committee for review, approval, and submission to the Office of the Administrator of the Federal Security Agency for final approval. Appeals from employees for change of ratings were relatively few. The fact that automatic promotions are now governed by the efficiency ratings has greatly increased the significance of the procedure, as well as the responsibility for its supervision. The following table shows the distribution of efficiency ratings according to adjective symbols in 1941 and 1942:

Year	Percentage				
	Excellent	Very good	Good	Fair	Unsatisfactory
1941	19.5	50.0	27.6	2.7	0.2
1942	16.3	50.3	30.1	3.0	.3

Recently, "probational ratings" of new employees have been introduced to strengthen the effectiveness of the rating system. "Probational ratings" of new appointees are made at the end of the tenth month of service; if ratings are favorable, employees are retained; if not, they may be released before the end of the twelfth month.

The Chief Clerk's Office has been responsible for the preparation of departmental pay rolls and for pay-roll deductions for war bonds. The Credit Union and the Relief and Recreation Associations continued to function. A sizeable tract of land was provided near the Administration Building for Victory Gardens.

The Public Health Service Claims Board handled a large number of claims against the Federal Government, under the authority of the Acts of December 28, 1922, and June 15, 1936. These claims involve loss or damage to private property caused by the negligence of a Government employee while acting within the scope of his employment or for which a vessel of the Public Health Service is found to have been responsible.

Civil Service Personnel Office

The Civil Service Personnel Office was established in 1943 under the direct supervision of a personnel officer. Appropriate sections were set up to deal with the specific functions of the office, namely, classification, recruitment, placement, and appointment of employees in the departmental and field services. Employee counseling and in-service training are also provided for departmental personnel.

During the current fiscal year, approximately 1,900 reclassifications and new position classifications were completed. In addition, 4,000 identical positions were acted upon to fill vacancies. Job instruction training courses (JIT) were given to 90 supervisors in the departmental service and orientation techniques were introduced for all new employees.

A major burden carried by the office was the preparation of a multitude of reports for the Civil Service Commission, the Budget Bureau, and the Congress. Journal actions representing changes in personnel numbered 36,000 and incoming personnel mail totalled 145,000 items.

A consolidated statement of personnel is presented in Appendix B.

Budget and Fiscal Office

The Budget and Fiscal Office, established in 1943, is responsible for all budget work, appropriations and fund accounting for the Public Health Service. The office functions under the direct supervision of a budget and fiscal officer.

During the fiscal year 1943, budgets were prepared for deficiency appropriations of 1943, and for the regular and supplemental appropriations for the fiscal year 1944. Budgets submitted to Congress totalled $5,203,400 for the 1943 deficiencies, $55,638,000 for the regular appropriations 1944, and $45,275,500 for the 1944 supplementals. The sums appropriated for these purposes were $5,742,000, $53,523,180, and $45,100,500, respectively. Conferences and hearings were held throughout the year on budget and fiscal matters.

Division of Foreign and Insular Quarantine and Immigration

Assistant Surgeon General G. L. DUNNAHOO in charge

Medical Director M. C. Guthrie served as Assistant Surgeon General in charge of the Foreign Quarantine Division until January 1, 1943, when he was succeeded by Surgeon G. L. Dunnahoo.

Most of the problems confronting the National Quarantine Service during the last fiscal year continued, and some increased in intensity as the year progressed. One of the greatest difficulties encountered was the inability of stations, because of the shortage of personnel, to clear promptly vessels arriving in large convoys, some of which contained as many as 95 ships. It was necessary in many instances to continue night-boarding and also to board vessels outside prescribed anchorages.

Activities in connection with supervising the sanitary and ratproof construction of new vessels continued to increase. A total of 1,887 inspections on 1,407 vessels was made in 1943 as compared with 630 inspections on 363 vessels in 1942. The instruction of key workers in shipyards in matters pertaining to ratproofing and sanitary construction resulted in a decrease in the average number of inspections per vessel from approximately 1.7 in 1942 to approximately 1.3 in 1943. The fact that ratproofing vessels while under construction is of great value both economically and from a public health viewpoint, was demonstrated by the fact that only one vessel constructed under ratproof specifications of the United States Public Health Service within the past 3 years was fumigated for rodent infestation at a United States port during the fiscal year 1943. All the vessels fumigated for rodent infestation at the port of New York last year were of nonratproof construction and 85 percent of them were operated under foreign flags.

A progressive step from the standpoint of facilitating commerce was the inauguration of the use of a sanitary log form for vessels. The log provides quarantine officers and others concerned with cumulative information regarding the sanitary history of vessels through systematically recorded reports of previous inspections. These data make it possible for quarantine officers to classify vessels with reference to quarantinable disease potentialities and enable operators of vessels, on which high standards of sanitation are maintained, to avoid the delay, expense and inconvenience which inevitably result when vessels are required to undergo quarantine treatment. All interests concerned have reacted favorably to the installation of the sanitary log on ships. All vessels constructed by the United States Maritime Commission now utilize this form.

The status of shipping and the prospective expansion of aircraft work at the port of Greater New York made it advisable to center the medical phases of the immigration boarding activities for that port at the Quarantine Station on Staten Island. Effective May 1, 1943, and for a trial period of 3 months, the Chief Medical Officer at Ellis Island was relieved of all responsibility in connection with the actual boarding of vessels, as well as other immigration activi-

ties exclusive of the immigration work that is actually conducted on Ellis Island. These duties were transferred to the supervision of the Chief Quarantine Officer at Rosebank. The advantage of having a pool of medical officers conversant with both quarantine and immigration bording procedures who may be used interchangeably has been demonstrated fully during the period this arrangement has been in effect.

Due to the fact that a constantly increasing number of airplanes arrive in Washington, D. C., from Africa after a lapse of only 36 hours, a quarantine station was established in that city to protect the community from epidemic diseases common in Africa.

By joint action of the Federal Security Administrator, the Secretary of War, and the Secretary of the Navy, an Interdepartmental Quarantine Commission under the chairmanship of the Assistant Surgeon General in charge of foreign quarantine, composed of one medical officer from each agency, was appointed during the latter part of the year. The commission was instructed to examine into existing quarantine laws, regulations and enforcement procedures and to recommend such changes or modifications as might be necessary to protect the United States and our military and naval personnel in other countries against the danger of the introduction of quarantinable and other exotic diseases. The commission has completed its preliminary studies and will shortly undertake the required field work.

Under an agreement between the Governments of Mexico and the United States, large numbers of Mexican laborers were imported into the United States during the year for agricultural, mining, and railroad work. The United States Public Health Service, through this division, cooperated with the United States Department of Agriculture and the War Manpower Commission by supplying the medical officers and X-ray equipment required for the physical examination of these laborers. The examinations were made at points of origin in order to prevent nonadmissions at the border. Medical Officers of the Public Health Service were also detailed to Jamaica and the Bahama Islands to examine laborers imported from those countries.

The new Tampa, Fla., Quarantine Station on Davis Island was completed and occupied in March 1943, whereupon the United States Army was permitted to occupy immediately the entire quarantine reservation at Gadsden Point.

A new Border Inspection Station at Laredo, Tex., will be ready for occupancy soon. Urgently needed space for Public Health Service inspection officers at Brownsville, Tex., will be provided at the privately owned municipal airport upon completion of an addition begun early in 1943. Rehabilitation of the Philadelphia Quarantine Station at Marcus Hook, Pa., is still in progress.

The Reedy Island Quarantine Station at Port Penn, Del., which was occupied temporarily by the Navy Department, was returned to the custody of the Public Health Service. During the latter part of 1942, the remainder of the quarantine reservation at Craney Island, Va., was permanently transferred to the Navy Department, which already had a large portion of the island under its control.

In an effort to cooperate with other Government agencies to the fullest extent possible in the prosecution of the war, the following

temporary transfers of property under the jurisdiction of the Public Health Service were effected during the year: The Gulf Quarantine Station on Ship Island, Miss., to the United States Coast Guard; a portion of the quarantine reservation at Eagle Pass, Tex., to the United States Customs Service; part of the Galveston, Tex., Quarantine Station to the Navy Department; certain facilities at the New Orleans, La., Quarantine Station to the Department of Justice for immigration examination purposes; portions of the Sabine Pass, Tex., Quarantine Station to both the War and Navy Departments; and space in the Border Inspection Building at San Ysidro, Calif., to the War Department.

Tables showing the quarantine and immigration activities for the year are presented in Appendix C, tables 7 and 9.

Division of Marine Hospitals and Relief

Assistant Surgeon General W. F. OSSENFORT in charge

The provision of medical care in marine hospitals showed a moderate increase in the total number of patient-days of relief furnished and a marked increase in the number of admissions and discharges. Most of the beneficiaries treated at the marine hospitals were members of the American Merchant Marine and the United States Coast Guard. During the year, a large number of torpedoed merchant seamen were treated.

The number of acutely ill patients received at the hospitals increased, entailing the proportionate increase in the turnover of patients and intensification of the medical program. There was an increase in the number of cases manifesting definite mental illness and in the number of women and children treated in the marine hospitals. These conditions placed a heavier burden on the staffs of the hospitals so that, in many instances, increases in personnel were necessary.

Rapid turnover in nursing and attendant personnel and difficulties in recruitment of personnel in these categories caused administrative concern at nearly all stations. The problems incident thereto were accentuated by the needs of the armed forces and wartime activities in all communities. All stations took an active part in local civilian defense activities. The Gray Ladies of the American Red Cross rendered a very creditable service in many of the hospitals.

Coast Guard and Merchant Marine

The expanded medical activities relating to the Merchant Marine and the United States Coast Guard constituted major additional responsibilities. A medical department was established during the year in the War Shipping Administration. This, together with the wartime activities of this agency as operators of the Merchant Marine, afforded the Service an opportunity to furnish a broader medical program for its original and principal legal beneficiary, the American merchant seaman. Increasing numbers of physicians and dentists were assigned to full-time duty with Coast Guart units ashore and afloat. District Coast Guard medical duties, in many instances, were assigned to men in charge of marine hospitals, resulting in coordination of activities.

A neuropsychiatric program was made a part of the training program at the United States Coast Guard Academy at New London, Conn. It included classification of cadets, special services, lectures and seminars to all cadets, advisory service in disciplinary problems, and the development of new tests to fit the special needs of the Academy. This program has proved to be of unquestionable value.

The Public Health Service Hospital, Sheepshead Bay, Brooklyn, N. Y., was opened during the year and operated as a very busy station, affording medical relief to the large Coast Guard Training Station and Maritime Service Training Station on adjoining reservations. A school for pharmacist mates was inaugurated at the Maritime Station and a program was designed for training hundreds of men

to serve as technically trained laymen aboard sea-going vessels. This is the beginning of a minimal medical program, which includes first aid and sanitation, aboard American merchant ships.

Administrative Activities

Efforts at standardization of practice and improvement in technique continued. The Standard Classified Nomenclature of Diseases and Operations of the American Medical Association was adopted as the official nomenclature. The Public Health Service Standard Milk Code was followed at all stations. Blood and plasma banks were placed in operation in all of the larger hospitals. A multivitamin preparation meeting requirements recommended by nutritionists of the National Research Council and the Service was adopted as a standard to replace the many proprietary products in daily use in all stations. Standardization of serologic tests for syphilis and methods for treatment of syphilis were adopted in accordance with recommendations of the Venereal Disease Division.

The fullest use of decentralization of purchasing activity, together with the broadest possible delegation of the authority to make open market purchases, was found to be extremely helpful in expediting the business at field stations and resulted in significant economy.

Professional Accomplishments

Continuous caudal analgesia in obstetrics, developed by two members of the staff at the Staten Island Marine Hospital, received wide recognition as a distinct contribution to the practice of obstetrics. By this method trained physicians were able to accomplish safe and painless childbirth in about 90 percent of hospitalized deliveries. The method was not applicable in all cases. Complications were few in number and low in incidence. Maternal and fetal mortality and morbidity were lower than in any other method of obstetrical analgesia. This method of analgesia was found to be applicable to other fields of medicine and surgery. Great numbers of requests for demonstration and teaching of this technique were made by civilian practitioners singly and in groups. These requests were met as expeditiously as possible. A postgraduate school was inaugurated at the Philadelphia Lying-in Hospital as a cooperative program designed for further study and teaching of this method.

There was a marked increase of interest in leprosy. The marine hospital at Carville, La., the national leprosarium, was visited by 633 physicians. This hospital continued to study all cases intensively and to conduct studies in treatment of the disease. The results of the use of promin were encouraging.

Eleven scientific papers on subjects of clinical interest and value were published in professional journals during the year and 33 others were approved for publication. A number of physicians and dentists were given postgraduate training in specialties. Special studies were made in cooperation with the National Institute of Health.

Dental Service

Dental treatment was given to 344,928 beneficiaries of the Service by 267 full-time dental officers and 24 dental interns. Additional dental officers were assigned to 71 new stations of the Coast Guard, including 8 motorized dental stations and 3 stations beyond the continental limits of the United States, namely, Greenland, Honolulu, T. H., and Ketchikan, Alaska. Dental officers were assigned to 6 new training stations and ships of the War Shipping Administration. Three dental officers were detailed to the Alaska Highway project, 2 to immigration detention stations, and 1 to the Lend-Lease Administration.

The major items of treatment furnished and a comparison with the preceding year are shown in the following break-down:

	Fiscal year 1942	Fiscal year 1943
Number of patients treated	165,319	344,928
X-rays	43,564	74,523
Prophylactic treatment (hours)	23,173	47,839
Vincent's stomatitis (cases)	2,340	9,331
Pyorrhea treatments (cases)	4,488	5,370
Extractions	62,001	88,972
Alveolectomies	4,344	6,728
Alloy fillings	62,350	160,062
Gold inlays	1,478	2,365
Porcelain crowns	153	493
Silicate cement fillings	22,677	54,964
Dentures (full and partial)	8,199	10,061
Fracture cases	354	406
Number of treatments (out-patient)	340,592	819,812
Number of treatments (in-patient)	124,692	134,140
Total number of treatments	465,284	953,952

Nursing Service

The need for using experienced nursing personnel for new activities, together with unprecedented turnover in personnel, placed a heavy burden on the administrative nursing staff of the marine hospitals. A number of factors were responsible for the increase in the activities of the Nursing Service. The expansion of the Coast Guard and the number of alien detention stations created additional demands. Nursing service was inaugurated in the infirmaries of the residence halls for women Government employees in Washington, D. C., as a part of the medical care program; and the teaching program for pharmacist mates initiated at the marine hospitals, as well as an increase in more acutely ill patients at these hospitals, called for an expansion of the Nursing Service.

Employee Health Services

The Hospital Division was active in the development and expansion of Employee Health Services for certain Government agencies in Washington. The program includes prevention of illness and diagnosis of disease in general, treatment of illness due to work, and

special activities, including chest X-ray screening for tuberculosis. Practices that have been proved of value in the provision of health services for employees in industrial establishments have been incorporated into the program.

Statistical Reports

Tables showing (*a*) transactions at the United States Marine Hospitals and other relief stations; (*b*) medical services for various classes of beneficiaries; (*c*) classification of out-patient treatments furnished at United States Marine Hospitals and other relief stations; and (*d*) classes of beneficiaries and amount and character of services rendered in Appendix C, tables 13 and 14.

Needs of the Marine Hospitals

The following needs of the marine hospitals of the Public Health Service are apparent at this time: (1) Additional bed facilities at nearly all stations; (2) a moderately-sized general hospital in the Los Angeles, Calif., area; (3) a small general hospital in the Miami, Fla., area; (4) additional provision for obstetrical cases; (5) additional provision for tuberculosis cases; (6) increased number of regular commissioned medical and dental officers for hospital duty; and (7) a hospital for clinical research located on the grounds of the National Institute of Health.

Division of Mental Hygiene

Assistant Surgeon General LAWRENCE KOLB in charge

Studies of the Nature and Treatment of Drug Addiction

The research program has been modified due to the loss of the biophysicist and the psychologist. Male scientific aides who have left to participate in the war effort have been replaced by women. Part-time psychiatric studies have been added, and a former staff member is being trained for studies in neurophysiology.

Further studies of the addiction liability of demerol were carried out in order to learn whether or not the development of physical dependence would occur in the clinical dose range. It was found that this danger exists in the upper range of clinical dosage, particularly in patients having had previous experience with demerol.

A study of the therapeutic value of pyrahexyl compound, a synthetic cannabis-like drug, was made. The drug was found to be relatively inactive when given parenterally, but active when given by mouth. Its administration caused no appreciable reduction in the abstinence syndrome intensity.

In studies of blood flow, it was found that morphine causes a significant increase in the blood flow to the hand and forearm. Exercise tests indicated that the increased flow to the forearm probably was in the skin, not muscle. The resting blood flow to the hands of post-addicts is probably somewhat subnormal and that of addicts even more so. Demerol has an effect similar to that of morphine. Neither nicotinic acid nor its amide was found to improve blood flow to the forearm or recovery of flow to the resting level, following exercise.

Further studies were carried out concerning the influence of drugs on the abstinence syndrome. Single doses of benzedrine, alcohol (intravenously), nicotinic acid and pyrahexyl compound, administered at the thirtieth hour of abstinence, failed to ameliorate appreciably the morphine abstinence syndrome. Further studies with pyridoxine (vitamin B_6) showed that even when a dosage of 100 milligrams, four times daily, was given for 2 days before and 3 days after abrupt withdrawal of morphine, the abstinence syndrome was not modified.

Continuing studies of the pain threshold-raising action of morphine and other analgetic drugs indicate wide variations in pain threshold-raising response from man to man and from drug to drug.

Demerol has been furnished to the Clinical Division for use as a substitute for morphine. It seems to be as effective in post-addicts as it has been reported to be in nonaddicts. It has been found to be particularly useful in asthma and other clinical conditions involving smooth muscle spasm. It has not yet been used in sufficiently large amounts regularly enough to obtain an idea as to its relative addiction liability in comparison with morphine.

Hospitals for Drug Addicts and Mental Patients

Over 20 percent of the trained personnel of the hospitals have been called to active military service, and many more have resigned or transferred to war industries. Replacement of these men has been

difficult and new employees have had to be assigned to important posts without an adequate period of training under an experienced employee. This condition has adversely affected efficient operation.

United States Public Health Service Hospital, Lexington, Ky.

Most of the drug addict population of the Fort Worth hospital was transferred to the Lexington hospital, making room at Fort Worth for psychotic patients. Thus far only a limited number of psychotic patients have been treated at the Lexington hospital. There was a total of 1,801 admissions, of which 1,404 were men and 397 women; 36 of these were psychotic patients received from the Darnall Army Hospital, at Danville, Ky. At the beginning of the fiscal year the number of patients was 1,094 and at the close of the year 1,112; only 20 psychotic patients remained.

The treatment of the psychiatric war casualties has been a stimulating influence on the medical staff, especially upon the younger members who had the urge to take an active part in the war effort.

There have been no major epidemics. A slight increase has been noted in the number of cases of herpes Zoster, catarrhal jaundice, and impetiginous skin lesions. There has been a 10 percent decrease in infirmary patient-days on the acute surgical and medical wards. On the other hand, there has been a 75 percent increase in infirmary patient-days on the chronic disease and tuberculosis wards. The majority of the chronically disabled patients suffer from diseases of the gastrointestinal tract, asthma, bronchiectasis, chronic bronchitis and tuberculosis.

The educational department had an enrollment of 227 men and 77 women. Women seem to show greater interest in educational activities than do men. New courses in arithmetic, in refrigeration, and in radio repair are being offered. The medical staff is giving a series of lectures in mental hygiene. Group psychotherapy is also being inaugurated, candidates being recruited from those who attend the lectures and those who express an interest in further help.

The farm, garment shop, and furniture factory, operated under the working capital fund, continued to provide vocational training and rehabilitation for patients. The maintenance department also offered opportunities for rehabilitation and educational work.

Farm activities produced 38.2 percent of the food required by the institution. The farm supplied the Lexington Veterans Facility and the Lexington Signal Depot with meats and dairy products to the total value of $4,183.44.

The garment shop has supplied the entire needs of the institution with the kinds of clothing it is equipped to manufacture, although it has been difficult to secure raw materials. It also furnished the hospital at Fort Worth with 1,270 garments. The shop cut approximately 87,000 surgical dressings and 60,000 garments for 6 local chapters of the American Red Cross.

Large furniture orders were received from the Lexington Signal Depot and the United States Army Specialized Training Corps, located at the University of Kentucky. Patients assigned to this shop have worked diligently to meet the Army's requirements.

Follow-up studies of the results of the treatment of drug-addict patients are now being made yearly. The addiction status of 4,882

discharged patients, as of December 31, 1942, follows: Addiction status unknown, 42.1 percent; abstinent, 9.9 percent; died after release, abstinent, 0.8 percent; relapsed to the use of drugs, 42.1 percent; died after release, relapsed, 1.6 percent; died after release, unknown, 3.6 percent. It is significant that over 40 percent of the discharged patients have disappeared. Most of these men were prisoners or probationers whose fingerprints are on record in the Federal Bureau of Investigation. Since there has been no report from this Bureau of any infractions of the law by over 40 percent of the discharged patients, a great many of them must be regarded as having attained a social recovery.

United States Public Health Service Hospital, Fort Worth, Tex.

The treatment of narcotic addict patients has been reduced to a minimum, while the treatment of psychotic patients has increased. No more narcotic addicts are committed to this hospital by the Federal courts but addicts are still admitted as voluntary patients and as probationer patients.

During the year, 382 addict patients were admitted, of whom 213 were voluntary patients. To make room for psychotic patients, 112 narcotic addict patients were transferred to the Lexington Hospital, leaving only 99 in this hospital on June 30, 1943.

Mentally ill patients returned from active duty in the Army, Navy, and Marine Corps have been admitted and treated pursuant to Executive Order 9079, as well as other classes of psychotic patients who are eligible for admission to St. Elizabeths Hospital. The majority of psychotic patients have been received from the Navy. During the year, 701 psychotic patients were admitted and 473 were discharged. On June 30, 1943, 730 psychotic patients remained in the hospital.

The general health of the patients has been good and no epidemic diseases have occurred. Electric-shock therapy with curare has been used in the treatment of selected cases among the psychotic group with gratifying results. A definite improvement in the hydrotherapy department was made by removing from other places in the institution five continuous-flow tubs and installing them in a room in the building where the acutely disturbed psychotic patients are housed. The window panes in the ward for disturbed patients have been replaced with tempered, shatterproof glass.

An occupational therapy department has been developed by two occupational therapy aides who were transferred from St. Elizabeths Hospital. Occupational therapy and rehabilitation have been provided by the industrial activities established under the Working Capital Fund, such as farming and garment manufacturing.

The United States Navy unit assigned to the hospital to maintain official records and to perform other duties required for the Navy patients has been augmented during the year. It now consists of 1 pharmacist, 1 chief pharmacist mate, 2 pharmacist mates (1st cl.), 1 pharmacist mate (2d cl.), and a hospital unit of 25 ward corpsmen, under the direction of a lieutenant commander.

The American Red Cross has furnished a field unit at this hospital which correlates its activities with institutional and outside facilities for the welfare of the patients and persons interested in them. Affiliated with the American Red Cross are the Gray Ladies who furnish receptionists to register visitors and arrange visits with patients, a

pianist, and occasional assemblies to sew and mend for the patients. The Navy Mothers give a birthday cake to each patient on his birthday, and special groups of women from the Fort Worth Garden Club donate flowers and distribute them to the wards weekly.

The Red Cross Motor Corps furnishes transportation once daily for visitors between the hospital and town, and the Camp and Hospital Council Services sponsor two variety programs monthly.

A statistical summary of the movement of patients at the Fort Worth and Lexington hospitals during the year appears in table 20 in Appendix C.

Medical and Psychiatric Services in Federal Penal and Correctional Institutions

The Public Health Service has continued to furnish and supervise all medical, technical, and psychiatric services for Federal penal and correctional institutions under the jurisdiction of the Bureau of Prisons. At the close of the year, the Bureau of Prisons was operating a total of 25 institutions for which medical service was provided.

Owing to the unusual demand for young men by industries and the military forces, there was a marked turnover in the attendants and other subordinate male employees. Ninety-seven of a total complement of 153 attendants at the Medical Center left the Service. Turnover in personnel at the Medical Center and elsewhere resulted in impairment of the nursing and technical services. Although it was possible to recruit replacements for the majority of the vacancies, it was often necessary to accept applicants who were not qualified.

It was decided that the only psychopathic unit should be maintained at the Medical Center and the rest should be designated for other purposes. The facilities at El Reno, Okla., and Chillicothe, Ohio, were converted to special segregation sections. All the larger institutions harbor certain prisoners who are unable to mingle with the population at large or adjust to the routine program for one reason or another. Punishment is not indicated for the majority of them and symptoms of mental illness are not sufficiently pronounced to justify admission to mental wards. Some of them are known to have homosexual tendencies and are a menace to the institution unless their liberties are restricted. A few are potential escape hazards. Some are branded as informers and require protection. Others are afflicted with compulsions, obsessions, and other symptoms of mental disorders which interfere with normal adjustment to institutional life. During the past year, this group has been augmented by the admission of certain saboteurs, spies, and nonconformists who have been unable or unwilling to fit into the usual program of any prison or reformatory. For these and other special reasons, a fairly large group of prisoners have required special control, supervision, and separation from others and the two former psychopathic units at El Reno and Chillicothe have been used for this purpose.

It has been difficult to persuade some of the Selective Service violators to submit to routine protective health measures, including vaccination and immunization. Many inmates in this group harbor bizarre ideas relative to immunization, diets, fasting and other matters. Some of them not only object to any form of conscription or

war, but also protest, in the form of nonviolent resistance, to any plan prescribed for them in prison. Thus far the policy of compulsory immunization against smallpox and typhoid fever for all has been carried out.

A survey of several hundred Selective Service violators shows that the prevalence of mental disorders is greater than in other offenders. Many are afflicted with psychoses or definite mental illness of such a nature and degree as to require transfer to the Medical Center for special and prolonged hospital care. Medical officers have devoted much time to the special examination of Selective Service violators for parole and other purposes. They have furnished several hundred special reports of physical and mental examinations for Selective Service Boards now attached to the majority of the institutions.

The Federal courts have been sending defendants suspected of mental illness to the medical units of the penal institutions for presentence examination and study. Such cases require careful observation, repeated examinations, and the preparation of a special psychiatric report for the information of the Judge. Following special requests from some of the Federal courts, psychiatrists have been authorized to examine some defendants detained in county jails to ascertain the degree of mental competency and responsibility.

The inmate population of the Federal Reformatory for Women, Alderson, W. Va., exceeded the normal capacity of the institution throughout the year. The increase was due to enforcement of the May Act and resulted in a marked increase in medical activities.

The majority of May Act violators have received short sentences, usually 3 to 9 months; 41 percent of them were found to be afflicted with syphilis. The majority of them are young and have an early or communicable form of the disease, so that it has been advisable to provide intensive and rapid treatment in order to render them noninfectious before release. A few have not cooperated with the treatment schedule and, therefore, have been infectious or potentially infectious at the time of expiration of sentence. Such cases have been reported to the proper health authorities of their respective States. The majority of these offenders have returned to their home communities in a noninfectious state. Extensive treatment for gonorrhea has been followed in accordance with the accepted standards, using the sulfa drugs with careful observation for complications.

There have been no significant changes in policy or routine procedures at the Medical Center. The hospital was filled to capacity at all times and the central laboratory continued to perform serologic tests and special examinations for other institutions. Research work in the psychopathic unit continued. Special studies relating to psychoses and borderline mental disorders were carried out, and studies of sex hormone balance in homosexual psychopaths were initiated.

The character of psychotic inmates at the Medical Center changed somewhat owing to the increase in number of Selective Service violators. Approximately 18 percent of the psychotic patients were incarcerated because of violation of the Selective Service laws. A study of this group indicates that more than two-thirds of them did not deliberately violate the Federal law and do not harbor objections to service with the armed forces. Their offenses and incarceration appear rather to be directly the result of mental illness; 98

percent are single, 70 percent have vagrant or criminal records, and the great majority have defective family backgrounds as indicated by loss of parents, alcoholism, drug addiction, and insanity. It appears that Selective Service legislation has created an effective dragnet for the apprehension of prepsychotics, psychopaths, and other borderline and inadequate individuals. Psychological and psychiatric studies of this unusual group of Federal offenders were initiated during the year.

A tabular summary of the activities of the medical service appears in table 21 in Appendix C.

Studies of Mental Disease

The Section on Mental Health Methods has continued its survey of public mental hospitals. Forty-seven institutions located in 15 States were surveyed or visited.

Inquiries were answered and counsel given as to various aspects of mental health, including hospital work, State administration, mental hygiene laws, the planning of buildings for mental hospitals and schools, and instruction for pupil nurses in mental hospitals. A number of conferences were held with individuals and boards, including the Virginia State authorities, regarding post-war construction; the Social Security Board concerning rehabilitation problems; a group in Chicago, Ill., relative to the handling of alcoholics in the midwestern States; and officials of Selective Service regarding the utilization of conscientious objectors for work in mental hospitals. A study was made of the work of these men who are utilized mostly as attendants, or who are assigned to work on the farm, in the dairy, and in the business office.

Division of Personnel and Accounts

Assistant Surgeon General PAUL M. STEWART in charge

The personnel functions of the Service concerning other than commissioned professional personnel and all financial and accounting functions were transferred from the Division of Personnel and Accounts to the Office of the Surgeon General. The functions of the Division now consist of the supervision of all operations relating to commissioned medical, dental, engineering, and certain professional personnel, and the maintenance of property needs.

On July 1, 1942, there were 524 regularly commissioned officers on active duty and 70 on waiting orders. On July 1, 1943, there were 597 on active duty and 72 on waiting orders. There were 253 promotions of regular officers to higher grades, 226 of which were temporary promotions authorized by Public Law 11 of March 18, 1943. Eighty-six new appointments were made; 6 officers were retired; 8 died; 2 resigned; and 1 officer was separated from the Service.

On July 1, 1942, there were 555 reserve commissioned officers on duty. On July 1, 1943, this number had increased to 1,194. The number of Acting Assistant Surgeons on duty decreased from 1,001 on July 1, 1942, to 921 on July 1, 1943, while the number of contract dental surgeons increased from 48 to 87 during the same period. On July 1, 1942, 990 attending specialists were on duty. On July 1, 1943, this number had decreased to 876. One hundred and seventy-three medical and dental interns were on duty as of July 1, 1943, as compared with 140 on July 1, 1942. (See Appendix B, tables 3 and 4.)

Property Return Section

The Property Return Section accounts for all property of the Service, and 320 property returns were audited during the year. A total of $3,562.19 was turned in to "miscellaneous receipts" from sales of property. Property surplus to the Public Health Service valued at $14,941.62 was transferred to other Government departments. Surplus property of other Government departments valued at $4,645.61, and 42,810 pounds of sugar valued at $2,150.91, was taken over by the Public Health Service. Property valued at $97,312.24 was transferred from Service stations where it was surplus to other stations where it could be used.

Division of Sanitary Reports and Statistics

Assistant Surgeon General E. R. COFFEY in charge

The functions of the division were considerably expanded during the year. All health educational and informational activities of the Service were coordinated in the division. This involved the transfer from the Division of Public Health Methods, National Institute of Health, of the field demonstrations in community organization for health education. In addition, the division was made responsible for the review, approval, and clearance of all manuscripts prepared for public presentation by personnel of the Service, as well as for clearance of manuscripts prepared by other Federal agencies, which refer to health matters. The programs for the production and distribution of educational material and the general dissemination of information were conducted in close cooperation with the Office of the Surgeon General and with other divisions of the Service. Three divisions, States Relations, Venereal Disease Control, and the Division of Industrial Hygiene (National Institute of Health) maintained special personnel to act in liaison with the Division of Sanitary Reports and Statistics. The division also continued its functions of collecting and publishing morbidity and mortality reports, editing the Public Health Reports, and conducting a program for Negro health education.

Statistical Reports

Morbidity and Mortality in the United States

The preliminary death rate of 10.4 per 1,000 population and the provisional infant and maternal mortality rates of 4.8 and 2.7 respectively, per 1,000 live births (1942) were the lowest on record for the United States. The provisional general mortality figure for the first 6 months of 1943 was slightly higher than for the same period last year. The preliminary death rate for this period was 11.0 per 1,000 population, or about 3.8 percent higher than the rate of 10.6 for the comparable period in 1942.

For the following diseases the provisional mortality rates for 1942 were the lowest in the past 5 years: Typhoid and paratyphoid fever, diarrhea and enteritis under 2 years, diphtheria, scarlet fever, influenza, pneumonia, whooping cough, and tuberculosis. The death rate for measles was lower in 1942 than in 1941. The rates for encephalitis and poliomyelitis were lower than those for the three prior years. On the basis of incomplete mortality data from a few States and cities, the indicated fatality rate for poliomyelitis during the first half of 1943 was about 10 percent.

The principal diseases for which a higher mortality rate was reported in 1942 than in 1941 were cancer, diseases of the heart, cerebral hemorrhage, and diabetes. Other diseases with higher rates in 1942 are primarily diseases of adult life and old age.

The mortality from all accidents, including automobile accidents, was approximately 7 percent lower in 1942 than in 1941. For automobile accidents alone the rate declined almost 30 percent.

The incidence of meningococcus meningitis was 1.9 times higher during the calendar year 1942 than the 5-year median (1937–41).

Early in 1943, the disease reached epidemic proportions. Up to the week ending July 21, 1943, 12,482 cases had been reported in 1943—a larger number than for any year since 1914 when the collection of morbidity reports by the Service was begun. Each section of the country contributed to the high incidence except the East South Central and Mountain areas. The excesses ranged from about 1.2 times the median in the two North Central regions to almost 5 times the median in the New England area.

Although poliomyelitis was below the median expectancy in 1942, it became epidemic early in 1943. At the end of July it was above that for any other year since 1934. The above-normal incidence for the country as a whole was recorded principally in California, Texas, Oklahoma, and Kansas.

The relatively high incidence of anthrax in the eastern seaboard States prompted an inquiry by the health officers of those States. It was found that a large proportion of the cases were acquired from raw material, such as wool, hides, goat's hair and skins, and pickled sheep skins, imported from several South American countries, India, Scotland, Java, China, Arabia, Egypt, and Rhodesia.

During the year, information regarding the incidence and geographic prevalence of communicable diseases was supplied weekly to the medical departments of the Army and Navy and to other Government agencies. The system used in securing morbidity reports through the appointment of collaborating and assistant collaborating epidemiologists in the State and local health departments was continued. The incidence of communicable diseases in the United States from 1940–42 is shown in table 10, Appendix C.

Foreign Reports

The information regarding diseases in foreign countries was very incomplete. However, the fragmentary information received indicates increases in some of the quarantinable diseases, especially typhus fever. Increases over 1941 were reported in Algeria, Egypt, Morocco, Rumania, and Tunisia. A decrease in typhus was reported in Spain.

In China, twice as many cholera cases were reported for 1942 as for 1941. Plague and smallpox decreased in the majority of the countries reporting these diseases. Fourteen countries reported cases of yellow fever in 1942, compared to 16 in 1941. The highest incidence was reported in Bolivia with 94 cases and 15 deaths. Table 11 in Appendix C, indicates the areas in which quarantinable diseases were most prevalent.

Study of Laws and Court Decisions

The statutes and health department regulations of the States were searched to determine what diseases and conditions are required to be reported in the various jurisdictions. State session laws for 1943 were examined and digests are being made of those pertaining to public health. Digests were made of all Congressional bills introduced which were of interest to the public health authorities. Current weekly digests of decisions of courts of last resort were searched for decisions of public health interest.

The Public Health Reports

Volume 57, part II, and volume 58, part I, of the Public Health Reports were issued, comprising 52 numbers and containing 2,016

pages of text and tabular material, as compared to 2,120 pages in 1942 and 2,569 pages in 1941. Approximately 135 articles were published. Current statistics showing the prevalence of communicable diseases in the United States and quarantinable and other diseases in foreign countries were published weekly.

The Public Health Reports is sent each week to approximately 9,000 individuals and organizations. Among these are 573 officials and other employees of State health departments, 1,142 city and county health departments, 1,269 public and medical libraries, 395 medical associations and institutions, 104 hospitals, and 220 schools. The Navy receives approximately 1,500 copies, the Army 500 copies, officers and other personnel of the Public Health Service 1,300 copies, and other agencies of the Federal government, 130 copies.

Reprints of 103 articles appearing in the Public Health Reports were issued, compared with 97 in 1942 and 115 in 1941. Three new supplements were published during the year, as well as new editions of 2 reprints, 6 supplements, and 1 miscellaneous publication.

Negro Health Work

The objective of National Negro Health Week for 1943 was Health on the Home Front—Victory on the War Front. It is estimated that some 5,400,000 persons in 8,500 communities in 34 States participated in the program. Specific activities included: 12,500 health lectures, 750 showings of motion pictures, 2,000 exhibits, 350 radio programs, 2,500 newspaper articles, and health sermons in 7,500 churches. A total of 350,000 pieces of health literature were distributed and plays, pageants, and games were organized in the majority of communities. Some 2,000 clinics participated in the National Negro Health Week program and were visited by an estimated 150,000 individuals.

During the year, Negro health organizations in 44 communities located in 17 States were visited. In connection with these visits conferences were held, lectures given, motion pictures were shown, and 50,000 pieces of health litrature were distributed.

The chief of the Negro Health Section acted as consultant to the North Carolina School Health Coordinating Service and assisted the Public Health Service in the recruitment of Negro physicians and nurses for employment in the Emergency Health and Sanitation program. Three Negro physicians were commissioned in the reserve corps of the Public Health Service.

For the first time, the National Negro Health News has been printed by the Government Printing Office. Its circulation totals 4,000, of which 3,500 copies are sent to individuals and organizations participating in the program.

The school and community health education demonstration initiated last year in cooperation with the Georgia State Department of Public Health and the Fort Valley, Ga., State College was continued. The Negro physician in charge has extended the program to other communities.

Editorial Section

The Editorial Section continued to carry on the following functions: (1) Preparation of health education materials for distribution

through Federal, State, and local agencies; (2) preparation, review, and editing of other materials for the use of Public Health Service officials; (3) channeling of information on the professional and scientific activities of the Service through approved sources.

During fiscal 1943, 254 writing assignments were completed, a slight increase over the previous year, despite the fact that the section functioned with incomplete staff throughout the year. The section continued to compile the Weekly Report to the Administrator and to edit the Annual Report of the Surgeon General. For the first 9 months, the monthly News Letter of the Division of Industrial Hygiene, National Institute of Health, was prepared.

The most time-consuming task of the Section has been the review and correction of materials of all types prepared by outside agencies, chiefly Federal war agencies, newspapers and commercial firms. In the same category is the greatly expanded responsibility of reviewing for approval papers prepared by the scientific and professional personnel of the Public Health Service.

Among the educational materials prepared were Nos. 10–13 of the Workers Health Series, *Malaria Quiz for Young Americans*, *From Hand to Mouth*, a manual for food handlers, and folders on malaria, safe water, and X-ray diagnosis of tuberculosis. Ten of the United States Public Health Service leaflets on the cause and prevention of specific diseases were rewritten.

The third edition of the Annotated List of Public Health Service Publications was compiled for adult study groups and teachers, and a catalogue of industrial hygiene education materials was prepared.

In cooperation with the Distribution Section, a review was made of the 1943 inventory of Public Health Service publications, which had been submitted to the Service by the Government Printing Office. The study involved the review of 3,194 publications with dates of issue covering more than half a century (1885–1943.) Consultation on the selection of health education materials was given to a number of individuals in official and nonofficial agencies.

Graphics Section

Work was completed on nineteen publications, including original design, lay-out, hand lettering, and illustrations, compiling material and assembling for reproduction, requisitioning and checking proof.

Posters produced by the section numbered 31 compared to 20 in 1941–42. Among the posters completed, 17 were on industrial hygiene problems, 8 on malaria control, 3 on tuberculosis control, and 1 each on water supplies, rat control, and venereal disease control. In addition, approximately 150 miscellaneous charts, graphs, statistical material, lay-outs, and drawings were prepared for publications, displays, and other uses. Art work for various lay-outs, posters, and exhibits was loaned to 3 State health departments.

Two sound film strips, "Malaria" and "Safe Water," were produced. Photographs were taken for "Malaria" at Memphis and Walnut Log Lodge, Tenn., and Decatur, Ala. The "Safe Water" photographs were taken at Upper Marlboro, Md.

Four new exhibits were designed and constructed. They are: Airplane Quarantine, Mobilizing for Health (general public health),

Care versus Caries (dental), and Health Education Materials. Three exhibits were revised. These and previously constructed exhibits were shown at 18 places during the year.

Eight photographic assignments were completed in the field. Among these were the malaria and safe water film strips; public health nursing made at Rockville, Md.; gonorrhea selectro-slide film on case holding, made at Raleigh and Durham, N. C.; kodachromes of mosquito models made at the Museum of Natural History, New York, N. Y.; and a kodachrome slide series on venereal disease control, made at Raleigh, N. C., and Columbia, S. C. In addition, six local photographic assignments were completed.

The section has available for distribution 3,000 photographs of different subjects pertaining to public health. During the year, 2,785 photographs were furnished from the files, an increase of 35 percent over the number supplied during the previous year. Many photographs were furnished to Government agencies, including the War Department, Office of War Information, Navy Department, and the Coordinator of Inter-American Affairs. Approximately 80 prints were furnished to publishing firms for textbook illustrations, and an additional 420 to magazines, newspapers, and news and film services. State and local health departments received 455, while universities and public schools were supplied with about 140.

Radio, Motion Picture, and Distribution Section

Fifteen radio programs, written in the section, were broadcast over the Mutual network in the Federal Security Agency's series, "I Hear America Singing." Four programs prepared by the Section were transcribed by the Office of War Information for its "Uncle Sam Presents" series. Two round-table discussion scripts, entitled "Mental Hygiene" and "Know Your Children," were written for presentation by State and local health departments.

A motion picture, "Fight Syphilis," was produced with the assistance of the Office of the Coordinator of Inter-American Affairs, which will handle distribution of the film in Central and South America. State and local health departments purchased more than 100 prints of this film.

Three motion pictures were produced by other organizations in cooperation with the Public Health Service ("Help Wanted"—Johnson & Johnson; "On Your Feet"—Melville Shoe Corporation; "Wartime Nutrition"—Office of War Information). Prints of these films were supplied to all State health departments on long-term loan.

One hundred prints of the malaria and safe water film strips were purchased for circulation to State health departments and for the use of Public Health Service educational personnel.

Requests for the loan of films increased 50 percent over the previous year. Requests for Public Health Service films were referred to the applicant's State health department whenever that department was able to supply the print from its own film lending-library. One hundred prints of the venereal disease film, "Know For Sure," were supplied to the United States Army.

During the year 1,291,040 publications were distributed without charge. This includes 521,847 to mailing list and 769,193 on request.

Field Activities in Health Education

Health education consultant services have steadily expanded since the transfer of the health education work from the Division of Public Health Methods to the Division of Sanitary Reports and Statistics. At the close of the fiscal year 1943, eight consultants had been recruited, given special training, and were active in the field.

Community health programs were extended to two new States and five new war areas during the fiscal year.

The program of community education for malaria control as a supplement to the Malaria Control in War Areas program has been effective in increasing control activities in civilian areas surrounding military and industrial establishments in endemic regions of the South. The program was limited to 26 counties in 7 States. Persons who carried out the program were chiefly teachers unoccupied during summer months. After an intensive training course, they returned to home communities to carry out malaria education under the supervision of the county health officer.

A healthy education program consisting of six monthly meetings was conducted for Public Health Service personnel. Two health educators and two nutritionists have been employed to extend the health education activities to the health and medical program for Federal workers in the Washington area.

"What the Public Knows About Health," a report on the survey consisting of 100,000 tests made at the New York and San Francisco World Fairs was completed and copies distributed to health educators in State health departments and to members of the Advisory Committee of the Visitory Action Study of the New York World's Fair.

The professional training of health educators also became a function of the section during the year. In January 1943, a grant of $40,000 for fellowships in health education was obtained from the W. K. Kellogg Foundation. Announcements of the availability of the fellowships were sent to prospective applicants, State health officers, district directors, and to professional journals. Seventeen fellowships were granted from the Kellogg funds and seven more were provided from other funds. A course in health education was instituted at the University of North Carolina. After 1 year of training including field work in various communities, these health educators will be available for employment by State to organize health education programs in communities needing such programs.

National Institute of Health

(Division of Scientific Research)

Assistant Surgeon General R. E. DYER, Director

The research branch of the Public Health Service, the National Institute of Health, has received many assignments to study problems closely related to the war effort. Many investigations were undertaken directly at the request of the Army and Navy and other war agencies. Findings were communicated in each instance to the proper authority, but owing to their military significance they are being withheld from general circulation until after the war.

The library now contains 42,602 volumes, an increase of 1,171 volumes. Books acquired by purchase numbered 429; 427 volumes were received as donations; the remainder consisted of the bound volumes of periodicals and books received in exchange. The library received approximately 479 periodicals, of which 291 were paid subscriptions. A total of 14,311 books and periodicals were circulated. Of these, 12,767 were circulated within the Institute and Public Health Service, and 1,544 were loaned to outside libraries. The library loaned material to 34 libraries; a greater number of books and periodicals was borrowed from libraries in Washington, New York, Chicago, and Philadelphia. A total of 2,446 photostat pages, 725 pages of bibliofilm and 1,147 pages of medicofilm was supplied upon request.

Publication of articles has been restricted because of the confidential nature of many National Institute of Health investigations. Seventy-six articles were recommended for publication in Public Health Reports; 62 were approved for publication in the Journal of the National Cancer Institute; 10 were recommended for publication as Supplements to Public Health Reports, leaflets for general distribution, or other Service publication; 288 papers were approved for scientific journals or for presentation before scientific societies; and 30 manuscripts were reviewed and criticized at the request of other divisions of the Public Health Service or other agencies.

Two National Institute of Health Bulletins were issued, one on the toxicology of beryllium and one on industrial manganese poisoning.

Division of Biologics Control

Senior Surgeon M. V. VELDEE in charge

By law the major activity of the Division of Biologics Control is the enforcement of the provisions of the Biologics Act of July 1, 1902. The requirements of the military forces and of foreign countries markedly increased the exercise of control measures and the testing of products. Research related to civilian needs was, therefore, curtailed to a large extent.

Arsenical preparations.—The study of the comparative curative value of the arsphenamines has been extended to include the phenarsine type of compound. Evidence indicates that the chemotherapeutic ratio is more favorable with the arsphenamine type of arsenical than with the phenarsines.

By authority of the Act approved July 2, 1942 (Pub. Law 647), the control of the arsphenamines has been extended to include other organic arsenic compounds therapeutically analogous to arsphenamine. In accordance with this authority, license has been granted for the manufacture and sale of dichlorophenarsine hydrochloride and oxophenarsine hydrochloride. Minimum standards of potency have been established and methods for the control of quality have been prepared which will be used for their introduction into the United States Pharmacopoeia.

As in previous years, some complaints against one or another of the arsenical preparations have been received. These have been investigated and proper steps taken. It should be noted that clinical complaints against oxophenarsine hydrochloride (mapharsen) have not appeared since control was assumed by the Service.

Media for sterility testing.—The use of sodium thioglycollate as a reducing agent in the test medium has been compared with two more recently mentioned agents. The thioglycollate still seems to be the most satisfactory. It has been determined that the protein nitrogen content of the test medium could be derived from vegetable sources as well as from meat—the present source. A papain digest of cottonseed, soybean, or peanut meal provides a form of peptone which can serve as a culture medium base either alone or in combination. A combination of cottonseed and soybean meal digest appears at least equal to the formula in use at present.

Pyrogenic substances in biologics.—Studies were made of the pyrogenic properties of a wide variety of bacteria which accidentally might appear as contaminants of normal plasma, serum, or serum albumin. Both the bacteria and their metabolic products were studied by the rabbit thermal test as defined by the National Institute of Health and the United States Pharmacopoeia. Considerable variation was observed in the pyrogenic activity of different species and also in the time at which the highest thermal response occurred. In general, the gram-positive organisms are relatively nonpyrogenic as contrasted to marked pyrogenicity of the gram-negative organisms. However, with the latter group, the variations are wide.

Standards of permissible pyrogenicity have been established for the diluent water used in dissolving dried plasma or serum, and also for the serum albumin solution.

Normal human plasma.—The value of normal human plasma as a therapeutic substance in the treatment of shock, burns, and related conditions has been established by further favorable evidence. It is undoubtedly one of the greatest therapeutic agents of all time in emergency treatment. Normal serum, though less extensively used, is equal in effectiveness. The need for plasma by the armed forces has steadily increased during the year. Nine licensed biologic laboratories are processing blood donated by over 90,000 persons each week. The blood is being collected in 30 bleeding clinics and by mobile units operating out of these fixed clinics.

The collection and processing of blood plasma is a joint effort of the Red Cross, the Army, Navy, and Public Health Service, with the latter responsible for standards of quality. Minimum requirements for both plasma and serum have been revised during the year in order to embody the most recent developments.

Normal serum albumin.—As a byproduct of research for other blood substitutes, normal human serum albumin was developed by a group working at the Harvard Medical School. Osmotically, the serum albumin fraction of plasma possessed approximately 80 percent of the value possessed by whole plasma. Albumin in 25 percent solution is osmotically five times more effective than normal citrated plasma and in this form becomes especially useful in emergencies where the volume of the package is a matter of great importance. The high processing losses do not justify its use for civilian needs. Certain byproducts derived from the globulin fraction, however, do somewhat reduce the economic wastage. Six laboratories have been licensed for the production of serum albumin solutions.

Bacillary dysentery.—Four laboratories are now licensed to manufacture concentrated and refined monovalent dysentery (Shiga) antitoxin and two additional laboratories have begun production. The potency of their product varies from 2,500 to 5,000 units per cc.

A standard Shiga antitoxin has been prepared and titrated to a value comparable to that of the International Standard Shiga Dysentery Antitoxin. This standard has been dried for stability but is distributed as a solution of specified potency. Minimum requirements for the production and control of dysentery antitoxin (Shiga) have been prepared and are in use.

Cholera.—In assaying the potency of cholera vaccine, 55 strains of typical Inaba and Ogawa strains of *V. cholerae* were studied. Volunteers were given injections of the vaccine used by the armed forces and studies were made of the antibody level of their serums at various intervals up to 8 months after vaccination. In mouse-protection tests, the antibody response to the vaccine was prompt, definite, and persisted at a high level up to 8 months.

Gas gangrene.—Volunteers were actively immunized with a mixture of perfringens and tetanus toxoids. All persons immunized responded to the perfringens toxoid, giving values of from 0.125 unit to 0.75 unit with an average of 0.33 unit antitoxin per cc. of serum. Tetanus toxoid stimulated greater antitoxin response when given in combination with perfringens toxoid than when given alone.

In another study, guinea pigs immunized with perfringens toxoid alone were resistant to enormous numbers of viable and highly virulent organisms injected intramuscularly, or to many lethal doses of toxin.

Typhoid vaccine.—Minimum requirements for typhoid vaccine were established on the basis of a potency reported in 1942. Periodic checks indicate that the test is working well in the producing laboratories and undoubtedly will increase the reliability of typhoid vaccine distributed by them. Further studies are needed to develop ways of reducing the severity of the reactions following the injection of typhoid vaccine. This is a matter of great importance in civilian preventive practice where compulsory vaccination can rarely be enforced.

Licensed establishments.—At the close of the fiscal year, 64 establishments held license for the manufacture and sale of 184 individual products. Many of these products are marketed in various combinations and mixtures so that the number of preparations as they appear on the market is much greater. Licenses were issued to 2 firms, and licenses of 10 foreign firms were canceled.

Division of Chemistry

Professor CLAUDE S. HUDSON in charge

Sugar researches.—Fundamental studies relating to the structure and configurations of the carbohydrates were continued. A continuation of the researches on anhydro sugars included: A study of the degradation of phenyl-β-lactoside in hot alkali, obtaining crystalline 4-β-D-galactosido-D-glucosan <1,5>β<1,6>; the isolation of 4-β-glucosido-glucosan <1,5>β<1,6> through a similar degradation of phenyl-β-cellobioside; the isolation of a new crystalline heptose anhydride through the degradation of phenyl-D-gluco-β-D-gulo-heptoside; the isolation of D-glucosan <1,5>β<1,6>, in fair yield, through a similar degradation of thiophenyl-β-glucoside; and completion of the work on 2,3-benzylidene-D-mannosan <1,5>β<1,6>.

Structural studies on acetals of sugar alcohols were continued. Diacetone-xylitol has been shown to be 2,3,4,5-di-isopropylidene-xylitol. The formaldehyde acetals of some sugar alcohols have been investigated. The acetolysis of such acetals has been shown to proceed with a partial rupture of the structure, and from acetolysis products monomethylene acetals were obtained. These compounds showed some antimalarial activity. Work has been completed on the acetolysis of trimethylene-D-mannitol and the 2,5-methylene-D-mannitol. Work is in progress on similar compounds of sorbitol, xylitol, adonitol, and erythritol.

Progress was made in the gluco-octose series culminating in the synthesis of D-gluco-L-talo-octose. Work has progressed in the gala-octose series; D-gala-L-gulo-octonic lactone has been crystallized and the corresponding phenylhydrazide and amide have been prepared. D-Gala-L-idonic acid phenyl hydrazide has been obtained in crystalline condition; and studies have been started to meet a preliminary indication that the work of Fischer and Passmore in the manno-octose series is in need of revision.

Other researches included: Preparation of a new monobenzylidene-arabitol, proving the structure to be that of 2,3-monobenzylidene-arabitol, while Fischer's monobenzylidene-arabitol was shown to have the structure of a 1,3-monobenzylidene-arabitol; hydrogenation of 1,6-di-iodo-dibenzylidene-mannitol to di-desoxy-mannitol, showing that reduction in presence of potassium hydroxide failed because the alkali destroyed the compound before hydrogenation took place and that substitution of barium methylate gave excellent results; condensation of acetobromoglucose with 2,3-benzylidene mannossan to give 2,3-benzylidene-4-[2,3,4,6-tetra-acetyl-β-D-glucosido]-D-mannosan; investigation of the reaction of sugar phenylosazones with copper sulfate, showing that the phenylosazones of the hexoses are oxidized by copper sulfate to form phenyltriazole derivatives; completion of proof that polygalitol is 1,5-anhydro-D-sorbitol; study of the mutarotation of D-altrose, obtaining data suggesting that crystalline β-D-altrose is a furanose form; proof that β-dibenzal-L-fucitol had the benzal groups on the 2,3,4,5-positions; a study of the equilibria in the reactions of formaldehyde on D-mannitol, 2,5-methylene-D-mannitol and dimethylene-D-mannitol in the presence

of hydrochloric acid; a study of the action of alkali on the methylene-bis-2-D-glycerose obtained from the periodate oxidation of 2,5-methylene-D-mannitol; and studies on the correlation of the α- and β-methylfuranosides and pyranoside structures.

Steroid investigations.—These studies were undertaken for the purpose of developing new methods for the partial synthesis of steroid hormones from readily available sterols and bile acids. A preliminary study of the side-chain degradation of neoergosterol was completed with the oxidation of neoergosteryl acetate with ozone, and with osmium tetroxide and periodic acid to form the new hydroxy-estratrienyl-propionic acid. Nine derivatives of this new compound were obtained for use as intermediates in hormone synthesis; and several additional new compounds have been prepared in connection with an investigation of the degradation of cholic acid.

Biochemical studies.—Experiments were continued in cooperation with the Division of Infectious Diseases on the effects of acid drinking fluids on teeth. Preliminary studies were made of the relative effects of lactic, pyruvic, glycolic, and citric acids, respectively, on rats' oral tooth surfaces; and experiments were started to study the effect of a 70 percent cane sugar diet, as compared with a 70 percent corn starch diet, on rats' molar teeth.

Analytical work.—About 45 analyses were made of miscellaneous material; 17 analyses of arsphenamines and neoarsphenamines; 218 of dichlorophenarsine hydrochloride; 464 of oxophenarsine hydrochloride and 8 of related arsenicals; 9 examinations of pharmaceuticals and 15 of vaccines and toxoids; 63 preparations of standard solutions; 250 micro determinations in connection with sugar researches; and analyses of 49 samples of drinking water in connection with dental caries studies.

Division of Chemotherapy

Senior Surgeon W. H. SEBRELL, Jr., in charge

Malaria.—The progress of this work is confidential because of its military significance. A very large series of new drugs has been synthesized and tested in the treatment and prevention of both avian and human malaria.

Chemotherapy of bacterial infections.—Five sulfa and seven sulfone derivatives were synthesized during the year. Their pharmacologic action was studied, including toxicity, absorption, elimination, acetylation, and chemotherapeutic action in experimental bacterial infections. Analysis of the data indicates that certain nitro derivatives of sulfonamides have a selective action against anaerobes, while the diamino-diphenyl sulfone derivatives have a strong antibacterial action against the tubercle bacillus. A N-phosphoryl derivative of diamino diphenyl sulfone has been found to be the most effective drug in experimental tubercle infections.

Tuberculosis studies.—The chorioallantoic membrane technique of tubercle infection has been shown to be a satisfactory guide in distinguishing between virulent and nonvirulent strains. It has been used routinely to test the chemotherapeutic effectiveness of drugs. With the aid of this test, it has been shown that attenuation of the virulence of tubercle bacilli can be effected by cultivation in media

containing low concentrations of some of the sulfone drugs, and that virulence can be augmented by cultivation on media enriched with chick embryo extract.

Insecticides.—In cooperation with the National Research Council, the pharmacologic action of a series of insecticides and insect repellents has been investigated. The progress of this work is of a confidential nature because of its military importance.

Burn shock.—A procedure has been worked out for the production of a standardized degree of burn in mice, which is uniformly fatal within 24 to 48 hours. Application of various forms of therapy has shown that pituitary extract, epinephrine and cortical hormone were of no value, while the intraperitoneal injection or oral administration of isotonic NaCl afforded a high degree of protection. Potassium salts antagonized this effect and other sodium salts, such as sodium bicarbonate, acetate or lactate, were equally effective. These results indicate that sodium deficiency is the critical determining factor in the fatal outcome. Experiments on the influence of environmental temperature on burn shock indicate that 75° to 85° F. is optimum for recovery, while temperatures above or below are detrimental. Burned mice, surviving as a result of sodium therapy, are used for the study of the chemotherapeutic effects of various antibacterial agents to determine their value in the prevention and treatment of the late infections following burns.

Arsenicals.—Mapharsen was shown to possess trypanocidal action in mice when administered orally. When two moles of glutathione were added, its oral toxicity was decreased without affecting its therapeutic effect, so that a therapeutic index was obtained which compared favorably with intravenous medication.

Gerontology.—Studies of kidney function have been continued in aged human subjects. Clearance values for inulin, diodrast, and urea, and estimates of total tubular mass of the kidneys have been made. In all the older patients tested thus far, the diodrast clearances of tubular mass have been below normal. Values for inulin clearance have not been significantly reduced. The older patients thus show no significant reduction in glomerular filtration but a definite reduction in tubular function of the kidneys.

Preliminary experiments on recovery from muscle fatigue were carried out together with studies of the effects of the oral ingestion of niacin. Experiments on the effect of various vitamin preparations on work output and recovery from fatigue were performed on the perfused frog.

Nutrition

The division assisted the Food and Nutrition Board of the National Research Council, the Nutrition and Food Conservation Branch of the War Food Administration, and the United Nations Conference on Food and Agriculture.

Sulfonamides.—The following pathologic changes have been observed in rats given one of several sulfonamide drugs in purified diets: Hyalinization, necrosis, and calcification of voluntary muscle; a dermatitis; a granulocytopenia, leukopenia, and hypo-cellularity of bone marrow; an anemia; hyaline sclerosis, and calcification of blood vessels, necrosis of heart muscles, kidney damage, liver damage, and hemorrhage into various organs and subcutaneous tissues.

It has been shown that the hyalinization, necrosis, and calcification of voluntary muscle can be prevented by α-tocopherol (vitamin E) and that the dermatitis can be cured or prevented by biotin. The granulocytopenia and anemia can be corrected by various liver preparations.

Deficient diets and infections.—Further evidence indicates that partial deficiencies of either riboflavin or thiamine increase the susceptibility of mice to lethal infections with certain pathogenic organisms.

Avidin-biotin.—Avidin has been found in the oviduct and in the secretions of the genital tract of several species of animals. This indicates that avidin may play an important role in embryonic development or in the physiology of the genital tract. It has been observed that the secretion of avidin is related to hormonal control.

Dietary liver damage.—A study of the role of alcohol in the production of liver cirrhosis in rats has shown that a deficiency of protein and choline are the primary factors but that the ingestion of alcohol exacerbates the effects of the deficiencies.

Miscellaneous and cooperative studies.—Assistance was given the Pan American Sanitary Bureau in planning a nutrition program, in the training of a nutritionist, and in setting up a nutrition study in Mexico. A large number of vitamin assays of foods are being carried out in cooperation with the Army and the National Research Council. Assistance was given to the Vitamin Committee of the Combined Food Board in the allocation of synthetic vitamins. State health departments were advised regarding their nutrition programs.

Division of Industrial Hygiene

Medical Director J. G. TOWNSEND in charge

Wartime demands upon the division and the numerous cooperative Government industrial hygiene services reached a new peak in 1942–43. However, shortages of personnel and facilities have impeded the expansion of services to meet these needs. As a result, the resources of the division have been concentrated upon the first objective of the industrial hygiene program—namely, the creation and maintenance of a safe and healthful working environment in the Nation's war production plants.

Consultant Services and Cooperative Activities

State Program

Shortage of manpower has impeded the program of recruiting and training personnel for industrial hygiene work. The division has been able to maintain a staff of about 200, but securing personnel for replacements has become steadily more difficult. In the States the problem is particularly acute. At the end of the fiscal year, 59 persons were serving in key positions in 25 States on a loan basis.

Essential field and laboratory equipment was loaned to many of the States, and about 700 submitted samples of materials were analyzed. State industrial units have been assisted in making special surveys and epidemiologic investigations of occupational diseases in war plants. Industrial hygiene programs have been appraised in nearly every State to determine to what extent their services to war

industries could be augmented. Industrial hygiene units were established in Oregon, Washington, New York, and New Jersey, bringing the total number of units to 47 in 38 States. The sum available for the support of industrial hygiene units during the fiscal year was $1,006,000; 54 percent of that amount was derived from Federal grants-in-aid. Health and safety hazards were investigated in 5,688 plants employing 2,600,000 workers located in 29 States.

War Department

Seventy-five of the 143 Government industrial plants originally certified for inspection have been completely surveyed and 9 have been resurveyed. Reports and recommendations on 70 surveys and 9 resurveys were submitted to the Safety and Security Branch of the Office of the Chief of Ordnance. At the request of the Secretary of War, a physician and an engineer were assigned to the Chicago headquarters of the Safety and Security Branch. Recently, the Office of the Chief of Ordnance issued a directive which increased the scope of State industrial hygiene services. Under the directive, ordnance inspectors visiting privately owned and operated plants will inquire as to the needs of the plants for industrial hygiene services through their State agencies. Plants not receiving service are reported to State or local units by the Division of Industrial Hygiene.

Cooperative agreements between the Division of Industrial Hygiene and the Office of the Provost Marshal General have made possible the participation of State industrial hygiene units in the inspection of certain other private war plants. Officers of the Office of the Provost Marshal General inspect the plants and submit their findings to the division with recommendations for further action.

United States Maritime Commission

A cooperative agreement has been reached with the Division of Shipyard Relations of the United States Maritime Commission, which is responsible for the supervision of safety and health in the Navy and Maritime shipyards located in 28 States. Under this agreement, State and local industrial hygiene units are conducting studies of the yards in several States.

American Medical Association

Cooperative agreements between the division and the Council on Industrial Health of the American Medical Association have resulted in a closer working relationship between governmental industrial hygiene services and medical societies. The Council has promoted the formation of committees on industrial health in State and county medical societies which have, in turn, sponsored wartime institutes in 10 States. Members of the division have participated.

Industrial Nursing

There are now 25 nursing consultants attached to divisions of industrial hygiene in 19 States. In March 1943, the division conducted a 10-day institute for nurses on wartime problems in industrial hygiene. Seventy nurses attended the institute.

The Nation-wide industrial nursing survey, conducted by the Committee to Study the Duties of Nurses in Industry of the American Public Health Association and the Division of Industrial Hygiene,

was completed. The survey covered the activities of 3,027 graduate registered nurses in 911 establishments employing 2,500,000 workers.

Industrial Dentistry

Three State industrial hygiene divisions have added full-time dentists to their staffs. In 26 other States the divisions of dental health and of industrial hygiene are initiating cooperative plans for the establishment of dental hygiene programs in industrial plants.

Miscellaneous Activities

Engineering consultant service has been given on problems in 24 States. The medical unit completed the survey of wartime medical services. The division sponsored the sixth annual meeting of the National Conference of Governmental Industrial Hygienists. The first joint meeting of the Conference with the American Association of Industrial Physicians and Surgeons and the American Industrial Hygiene Association was held in Rochester, N. Y., May 24–27.

Dermatoses Investigations

Thirty-six Army-operated, privately owned, Government plants and works were inspected; 55 other establishments, all of them engaged in the manufacture of war materials, requested assistance in the study of dermatoses problems. Many requests came from industrial hygiene divisions of State boards of health.

Two special courses on occupational dermatoses were given to medical officers of the armed forces, officers of the United Nations, State and local public health officials, industrial physicians, and private physicians interested in working in war industries. The first course was given at the National Institute of Health; the second in Chicago under the auspices of the American Medical Association. Postgraduate courses were given at various universities. A total of 66 lectures was given by members of the staff.

Thousands of patch tests were performed in testing new materials for the Army and Navy. These materials included antimildew agents, lousicides, flameproof substances, plastic cables for identification tags, and sunburn preventive ointments. Volunteers for such tests were obtained from the National Institute of Health, the Naval Hospital, and with the assistance of the Office of Civilian Defense.

Research on the following subjects has been carried out: Spread of fungi from flooring; protective ointments to be used against tetryl, mustard gas, lewisite, and industrial irritants; the isolation of the toxic principles of poisonous plants; the suitability of certain substituted materials in industry; prevention of the dermatitis seen in packers of Ration C; the mechanism of the louse bite; dermatitis from new airplane engine covers; indicator soaps for industrial irritants and war gases; and on occupational dermatoses in general.

At the dermatologic clinic conducted at the Public Health Service Dispensary in Washington, D. C., 733 old and new patients were examined and treated. During the first half of the year, 2,610 patients were examined and treated in the Emergency Room at the National Institute of Health.

Sickness Among Industrial Workers

The collection and analysis of reports from the group of industrial sick benefit associations, covering some 250,000 employees, was con-

tinued. The 1942 frequency rates, 106.1 per 1,000 males and 168.4 per 1,000 females, were the highest annual rates recorded since 1933. The male rate was 16 percent higher than the 10-year average of 91.1 and the female rate was 14 percent in excess of the 10-year average of 148.1.

The cooperative study with the Industrial Hygiene Foundation was continued. Figures for the first year (1941) were analyzed and a report issued. The study covered 50,000 males and 2,200 females employed by 14 Foundation member companies. The 1941 report showed a relatively high variation of disabling sickness rates among the different companies and a more favorable absenteeism experience among the 14 companies as a group than among other industries.

Education

Members of the division gave lectures and laboratory demonstrations at the Public Health Service orientation courses for Emergency Health and Sanitation personnel. The division continued to train State personnel in its laboratories and in State industrial hygiene units. Lectures and addresses were given at colleges and universities and before numerous other organizations.

In cooperation with the Division of Sanitary Reports and Statistics, additional workers' health education materials were prepared for the use of State and local industrial hygiene services and other interested organizations.

The *Manual of Industry Hygiene and Medical Service in War Industries*, prepared by the professional staff of the division, was published. The manual was issued under the auspices of the Committee on Industrial Medicine of the Division of Medical Sciences of the National Research Council.

Laboratory Research

Laboratory research was directed exclusively to the solution of practical problems concerned with the prosecution of the war. The exigencies of war have necessitated the development of entire new industries with plants using a great many chemical substances which are dangerous for workers. Research work to establish maximum amounts of these chemicals to which the worker may be safely exposed has continued. Fifty-four written confidential reports have been submitted to the military services, and 60 manuscripts have been submitted for publication. During the past months, from 8 to 16 persons from the Army and Navy have used the unusual facilities of the laboratory.

Toxicology of Explosives

The toxicity of three new explosives has been studied at the request of the Army. Recommendations made to the Ordnance Department were incorporated in a safety manual. The question of the intermediary and end-product metabolism of TNT has been investigated in several species of animals, as well as the effect of milk and vitamin C upon TNT intoxication. A study was made of the effect of TNT on human beings in a Federal ordnance plant. Methods for the control of industrial hazards encountered in the manufacture of explosives have been developed and were incorporated in the design of ordnance plants prior to their construction.

Toxicology of Solvents and Chemicals

The toxicity and potential dangers of ethylene glycol ethers, methylene dichloride, ethylene dichloride, tollac, velsicol, and benzene have been investigated in several species of animals. A quantitative method for the determination of catechol, hydroquinone, and phenol has been developed. At the request of the Army, an investigation was made of the potential toxicity for human beings of a new insecticide. The toxicology of tungsten and molybdenum has been investigated.

At the request of the Navy, a study was made of the toxicity of stibine. One phase of this study was completed and a confidential report submitted to the Bureau of Medicine and Surgery of the Navy. An appraisal of the toxicity of lead azide has been made and the findings have been published.

Aviation Medicine

The altitude chamber constructed in collaboration with the Navy has been operated throughout the year in connection with many special studies. Altitudes from sea level to 58,000 feet and temperatures from −67° F. to 100° F. can be simulated. It is possible to simulate ascents at any rate up to 18,000 feet per minute, with corresponding changes in temperature. Cold rooms suitable for studying the physiological effects of low temperature have also been installed. With these facilities, extensive studies have been completed. These include the development of oxygen-supply apparatus for high-altitude flying and appraisal of heated and unheated pilot clothing. Confidential reports have been submitted to the Navy.

Methods for the Detection of Atmospheric Contamination

Work on photometers for the determination of carbon monoxide and methemoglobin has been completed. Five detectors for the determination of mercury concentrations in the atmosphere have been constructed and calibrated, and are now available for field use. Spectrophotometric services have been rendered other divisions of the National Institute of Health and to the Army and Navy. Radioactive determinations have been made in dial-painting factories.

A new approach to the identification of chemical compounds has been made. This involves the use of X-ray diffraction patterns and permits an identification of such elements as beryllium when only a small amount of material is available for analysis. The method also differentiates between a mixture of lead oxide and metallic lead and is useful for distinguishing free silica and silicates in lung tissue. Analyses were made of 2,531 environmental samples from arsenals and ordnance plants. Improved methods for the quantitative determination of TNT, DNT, and halogenated hydrocarbons have been developed.

Other studies made for the Navy have included: The effect of ultraviolet light on the bacterial population in crowded living quarters; the effect of various aerosol compounds on air-borne infections; evaluation of methods for making sea water potable; investigation of emergency water containers for life rafts; and the transmission of infection through pilots' oxygen masks.

Psychophysiological Studies

A psychophysiological unit has been added to the division. One of the functions of this unit is to investigate the environmental, psychic,

and physiologic factors associated with fatigue. Tests for measuring neuromuscular and mental efficiency have been developed and successfully applied to subjects exposed to anoxia and certain drugs in the altitude chamber. These tests proved to be sensitive indicators of impairment in efficiency and revealed quantitative changes in performance which are not revealed by usual clinical examination.

"Cotton-sickness"

Work was continued on the etiology of the infection isolated by this laboratory last year. The infection resulted in an acute illness, commonly known as "cotton-sickness," and occurs among workers in low-grade stained cotton. The endotoxin-producing causative microorganism has been identified as *Aerobacter cloacae*. Morphologic, physiologic, and serologic characteristics were determined of four different strains of this organism isolated from samples of cotton and from hemp and grain dust.

Division of Infectious Diseases

Medical Director CHARLES ARMSTRONG in charge

Rickettsial Diseases

The investigations of the rickettsioses were continued at the laboratories in Hamilton, Mont., and in Bethesda, Md.

American Q fever.—Rickettsia diaporica has been recovered from spontaneously infected bedbugs. Persistence in bedbug tissue, infectiousness of bedbug feces, and transmission to the second generation have been demonstrated. Transmission by bite was not obtained. Persistence of this rickettsia in certain tissues and in the urine of guinea pigs has been shown.

Rocky Mountain spotted fever.—Studies were made of the use of immune rabbit serum as a therapeutic agent in clinical cases of Rocky Mountain spotted fever. The results suggest that the serum reduces the fatality rate when given early in the illness. The tick *Amblyomma americanum*, known to attack man, was indicated by epidemiological methods as being the vector of human cases, and the virus was isolated from collected field specimens. Preparation of Rocky Mountain spotted fever vaccine was continued; 465.8 liters were distributed.

Typhus.—Studies on typhus fever were planned: (1) To obtain information on the antigenicity of various lots of epidemic typhus vaccine in animals and human beings; (2) to improve this antigenicity by a variety of procedures; (3) to develop and improve tests for antibody titrations on the serum of persons convalescent from, and vaccinated against, epidemic typhus fever; (4) to carry forward immunological and virulence studies of various strains of typhus fever for the selection of strains for vaccine production. Definite results have been obtained in some of these studies and encouraging leads in others. Due to the great military importance of epidemic typhus fever, it is proposed to continue these studies. Epidemic typhus vaccine has been manufactured; 725.2 liters were distributed.

Studies have been continued on the significance and specificity of the complement fixation test in rickettsial diseases. The test has been used routinely to differentiate endemic typhus and Rocky Mountain spotted fever, and in the studies on typhus vaccine.

Possible new tick-borne disease.—Laboratory studies are being made of an unidentified filtrable disease agent, supposedly recovered from *Dermacentor andersoni.* An apparent case of this disease has occurred in a laboratory worker.

Virus Diseases

Choriomeningitis.—Two new strains of this virus were recovered from spinal fluid sent to the laboratory for study.

Epidemic keratoconjunctivitis.—Attempts to confirm the virus etiology of this disease, to date, have been unsuccessful.

Epidemic pleurodynia.—Evidence has been obtained in monkeys which suggests a virus etiology and the respiratory tract as mode of spread.

Jaundice.—An epidemic of jaundice occurring in the Virgin Islands was studied. The epidemic was apparently the result of immunization against yellow fever with vaccine containing human serum. An experimental study concerning the etiology of this type of jaundice has been conducted and the results published. The yellow fever vaccine now in use does not contain serum and so far as is known has not produced jaundice.

Pneumonia (atypical.)—Two strains, apparently identical, have been carried with difficulty through 30 mouse transfers.

Pneumonitis.—An epidemic of a fatal type of pneumonia (17 cases, 8 deaths) occurring in Louisiana was studied. The clinical, pathological, and epidemiological studies suggested this to be a previously undescribed disease. The cause has been isolated and appears to be a virus similar to, but not identical with, psittacosis. An effort is being made to determine the reservoir or source of the infection. Attempts to produce an effective vaccine are being made, as are also studies to determine better means of laboratory diagnosis.

Yellow fever.—A total of 1,114,000 doses of vaccine was prepared during the year. Tests carried out on serums from Army personnel vaccinated with aqueous base vaccine have shown a high percentage of protection.

An unidentified agent, probably a virus, has been recovered from a dead cockatoo which causes an extreme hepatitis in white mice.

Bacteria and Bacterial Diseases

Enteric infections.—The relative efficacy of various sulfonamides in the treatment and in the control of bacillary dysentery has been evaluated. The response to absorbed sulfonamides proved to be more favorable than that to the widely accepted, poorly absorbed preparations. The clinical response to sulfadiazine was particularly prompt and effective, in marked contrast to the delayed and uncertain reaction to sulfaguanidine.

The possible value of sulfadiazine in *E. typhosa* infection was considered. A marked bacteriostatic action of this drug in the enteric tract was clearly demonstrated. The clinical and laboratory evidence with respect to the effect of the drug on the generalized infection was uncertain.

The practicability and efficacy of a program of dysentery control involving cultural surveys for the detection of carriers and the treat-

ment of all infected individuals with sulfonamides was observed. It was found readily possible to reduce a high incidence of infection to a low one. With this change, clinical cases tended to disappear. The complete eradication of the infection was more difficult, particularly in groups of low-grade mental defectives.

Pneumonia

Laboratory investigations.—Work on the immunizing antigen from the pneumococcus was limited to the type-specific polysaccharide and a species, or non-type-specific, antigen. The latter species antigen has yielded, from type I pneumococci, a preparation which immunizes white mice against type II and type III infections; and, similarly, from type II and type III, preparations were isolated which stimulate immunity against the other types. Several substances have been found which increase the yield of pneumococci in 18-liter lots of horse-meat infusion to from 10 or 15 grams to 70 or more grams. A method was devised for the rapid drying of water solutions from a frozen state by employing a high frequency electric field as a source of heat *in vacuo*.

Four organic compounds have been synthesized which are as active against pneumococcus infection in white mice as any of the well-known sulfa drugs. These compounds and many others synthesized have been tested for activity against other infective agents causing respiratory diseases, including streptococcus, staphylococcus, and influenza virus.

Field study.—In a study made in cooperation with the Maryland State Department of Health, reports have been received on some 23,000 individuals injected with polyvalent antigen prepared from types I, II, and III pneumococci. There were no cases of lobar pneumonia and 2 cases of broncho-pneumonia during the period of study. Throughout the same counties, the general incidence of these 2 types of pneumonia was 115 per 100,000 for lobar pneumonia and 100 per 100,000 for broncho-pneumonia. When the results in the 2 previous pneumonia seasons were included (39,525 individuals), there were in the total immunized population of 62,755 some 17 cases of lobar pneumonia or a rate of 27 per 100,000, and 4 cases of broncho-pneumonia or a rate of 6 per 100,000. The average rate for the 3 years throughout the State, was 129 lobar pneumonia cases per 100,000 and 106 broncho-pneumonia cases per 100,000. There were 2 deaths, both due to lobar pneumonia, among the immunized population during the 3-year period. The State mortality rate for lobar pneumonia was 26 per 100,000 and for broncho-pneumonia, 24 per 100,000.

Tuberculosis

Field studies.—Epidemiologic studies of tuberculosis have been intensified, because of the necessity of evaluating pulmonary lesions found in the X-ray examination of individuals concerned with the war effort. Field studies have demonstrated in the southeastern States, Ohio, and Iowa that the occurrence of these calcified pulmonary lesions does not necessarily parallel the occurrence of tuberculosis. Present results indicate that these lesions can occur with no apparent relation to tuberculosis.

Laboratory studies.—The study of the relative virulence of strains of tubercle bacilli isolated from different geographic areas of the United States is being continued. Three strains of the *vole bacillus*, a new type of mycobacterium isolated in England, have been received for study.

Tularaemia

Bacterium tularense, virulent for experimental animals, has been found a common contaminant of certain streams and large irrigation ditches in Montana. The studies indicate that perhaps 10 percent of Montana's streams were at times contaminated from the fall of 1942 to the spring of 1943. No case of human infection proved to be due to the use of contaminated natural water has been found. Frogs, trout, and turtles placed in contaminated water did not become infected.

Fungi Studies

Coccidioides immitis.—At 6 stations in Arizona and western New Mexico, 1,976 rodents were trapped and examined. It was shown that the spontaneous occurrence of coccidioidomycosis in wild rodents in endemic areas is a common phenomenon. Strains of *C. immitis* isolated from rodents were found to be as virulent as strains from human sources.

Haplosporangium parvum.—This newly discovered fungus causes a pulmonary disease in rodents. The spontaneous disease in pocket mice and the experimental disease caused by it in laboratory animals have been investigated. Antigens have been prepared from both fungi, and that from *Haplosporangium* has been tested in man. It was shown that a fungus used in laboratories for testing fungicides intended for use against dermatophytosis, is a saprophytic fungus (Fusarium) unrelated to dermatophytosis.

Miscellaneous Investigations

Dental caries and fluorosis.—Studies were continued on the relation of fluorides to dental disease, especially dental caries. A study was begun at the United States Coast Guard Academy to test the feasibility of using topically applied fluorides to decrease the incidence of dental caries in individuals of military age.

The addition of about 1 p. p. m. F. to domestic water supplies as a means of decreasing the dental caries attack rate has been repeatedly proposed. To determine the safety of such a procedure, complete physical examinations of individuals, including X-rays of the lungs, bones, and spine, have been made in communities supplied with water of high and low fluoride content.

A modified method for the rapid routine isolation and mass cultivation of the smaller oral treponemes has been reported and numerous strains of these organisms have been isolated from cases of clinical Vincent's infection and are being studied.

Epidemiology.—In comparative studies made with the Norfolk City Union of King's Daughters Visiting Nurse Association in Norfolk, Va., it has been shown that the combination of diphtheria toxoid with pertussis vaccine, alum precipitated, not only gives protection against pertussis but gives better protection against diphtheria than

the ordinary alum-precipitated diphtheria toxoid alone—the best preventive to date. It was found that this combined preventive can be given advantageously at as early an age as 2 to 3 months; the earliest age heretofore recommended was 6 months.

Rheumatic fever investigations.—Clinical and laboratory studies of rheumatic fever, relating to proteinases in the urine of man which affect strains of hemolytic streptococci, were continued. The following tentative conclusions may be drawn: Enzymes lytic for the proteins of group A hemolytic streptococci are usually not demonstrable in the urine in health, but appear in considerable concentration following the onset of ordinary hemolytic streptococcus infections, including scarlet fever, and apparently persist only so long as the infections are active.

Malaria investigations.—Malaria blood slides for study purposes and instructions in malaria blood survey procedures have been supplied to medical schools, State health departments of the malarious States, and personnel of the Office of Interstate Malaria Survey.

Laboratory, field, and toxicologic tests were made on spray materials for the protection of troops against mosquitoes. New methods of applying and utilizing these sprays have been developed. A new larvicide which seems to be unusually effective is being studied. While some of the new repellents seem to be effective, the question of toxicity following continued use is being studied further.

National Cancer Institute

Pharmacologist Director CARL VOEGTLIN in charge

Administrative

National Advisory Cancer Council.—The membership of the Council as of July 1, 1942, was composed of Dr. Thomas Parran, Surgeon General of the United States Public Health Service, Dr. Arthur H. Compton, University of Chicago, Dr. Max Cutler, Chicago Tumor Institute, Dr. Edward Doisy, St. Louis University, Dr. George M. Smith, Yale University Medical School, and Dr. Waltman Walters, Mayo Clinic.

Dr. Waltman Walters resigned from the Council in August 1942, after being commissioned in the Navy. Dr. Baird Hastings, Harvard Medical School, was appointed to fill the vacancy. Dr. Mont R. Reid,* University of Cincinnati, and Dr. James B. Murphy, Rockefeller Foundation, were appointed in January to replace Dr. Max Cutler and Dr. George M. Smith, whose terms had expired. Dr. Ludvig Hektoen has continued to serve as executive director. Three meetings of the Council were held.

Nine grants-in-aid, totaling $49,400, were recommended by the Council, and all grants had been certified for payment by the close of the year.

Radium loans.—Forty-nine hospitals had loans of radium at the beginning of the fiscal year. One hospital terminated its loan after its trained radiological personnel entered military service. The loans to all other hospitals have been continued and 1 new loan has been

*Deceased May 1943.

made. Approximately 1,900 patients were treated with this radium during the year.

Trainees.—As of June 30, 1943, 56 physicians had completed a course of training in the diagnosis and treatment of cancer.

States relations.—All States have been resurveyed with reference to the development and status of their cancer control programs and consultation service has been given to many.

Research in Carcinogenesis

Metabolism and biotin content of tissue-culture-derived mouse tumor transplants.—Metabolism studies on normal cells which have been permanently altered by *in vitro* exposure to a carcinogenic agent strongly support the view that they are true cancer cells. The observation of the *in vitro* change of normal to cancer tissue is, it is believed, an extremely important contribution to the study of the causation of cancer.

Studies on the mammary tumor inciter in mice.—Experiments reveal a difference between mice of strains C and C57 Black in their ability to transmit or propagate the milk tumor agent and suggest the involvement of genetic factors in the transmission of the agent from generation to generation. Further experiments suggest that the genetic susceptibility of a strain of mice to the action of the agent is not necessarily correlated with ability to transmit or propagate the agent. Further experiments are in progress.

Effect of breathing tobacco smoke on strain A mice.—Findings support the statement that under experimental conditions tobacco smoke is noncarcinogenic to strain A mice.

Effect of diet on tumor genesis.—Studies of the effect of diet on experimental animals have been continued. It has been demonstrated that a caloric restriction delays the development of spontaneous leukemia but does not prevent it. Experiments have also shown that although 97 percent of the virgin females of the C3H strain develop mammary tumors on a complete diet, no mammary tumors develop on a diet low in cystine. On a diet low in lysine, tumors have developed in about 25 percent of virgin females of C3H strain. Virgin females and animals that had had one litter of C3H strain were fed on a diet complete in every respect, except for a 50 percent restriction in calories. These animals have not developed mammary tumors.

Genetics of pulmonary tumors.—Studies of the house mouse have shown that there are at least three known genes on three different chromosomes which are related to susceptibility of pulmonary tumors. This is in accord with the principle of the multiple factor of inheritance which has been found for this type of neoplasm of the mouse. Studies of the genetics of mammary gland tumors are also in progress.

Effect of X-rays upon blood and hematopoietic tissues.—The incidence of leukosis has been found in several preliminary experiments to be significantly increased by whole body exposure of mice to X-rays.

Urethane tumors.—In connection with the study on X-ray induction of tumors on local skin areas, it was accidentally discovered that the anaesthetic, ethyl urethane, greatly increases the incidence of lung tumors in C3H mice. Strikingly positive results have been obtained in four separate experiments, so that the finding seems well estab-

lished. A fair amount of preliminary evidence is on hand indicating that these tumors may be induced by a single anaesthetizing dose administered intraperitoneally.

Characteristics of Tumor Tissue

Enzymes.—Comparisons have been made of enzyme activity and concentration of certain components in tumors and in the normal tissues of origin of the tumors. Enzyme activity and concentration of certain components in the same tissues of normal and of tumor-bearing animals have also been compared.

Cathepsins.—Research has been continued on the cathepsins or tissue proteinases in order to learn more concerning the protein metabolism of tumor tissues. Cathepsins have been used as antigens in complement fixation and precipitation tests where the serum was obtained from animals with induced tumor (by feeding P-dimethylaminoazobenzene), or transplanted tumors (Jensen rat sarcoma and Brown-Pearce rabbit testicular tumor). The serums of these animals reacted positively when some of the catheptic preparations from their respective tumors were used as antigen in high concentrations.

Changes in cell structure.—Using the Golgi apparatus as an indicator of cell polarity, studies have been made of many of the tumors being carried in the institute and also of human tumors obtained through the cooperation of the Marine Hospital, Baltimore, and the Naval Medical Center, Bethesda, Md. The evidence obtained so far indicates that both in the mouse and in man change in polarity rather than loss of polarity frequently accompanies the malignant change. Complete reversal has been noted in one mouse hepatoma, in several human squamous cell carcinomas, in one human papilloma of the bladder and one of the fossa navicularis. Cells of spontaneous and induced pulmonary tumors as well as the Barrett osteogenic sarcoma retain their normal polarity. Change in polarity may be related to or concerned in the process of neoplasia.

Metabolism.—Studies of the chemical processes which supply the energy by which cancer cells can live and grow have been extended during the year to a variety of rabbit tumors. All malignant tumors examined showed a metabolism characteristic of malignant tumors generally, whereas the papilloma and fibroma showed values near that of comparable normal tissue. It was concluded that there was a very definite change in metabolism when the Shope virus papilloma passed over into the malignant carcinoma.

Tumor Growth

Influence of riboflavin.—The growth rate of the spontaneous mammary carcinoma was decreased in animals on the riboflavin-deficient diet. The tumor growth was reduced in animals after 3 weeks on the deficient diet and roughly coincided with the riboflavin depletion of the tumor. There was a marked increase in the number of spontaneous tumors in the tumor-bearing animals when they were fed a high level of riboflavin; there was no correlation between the total size of the tumor and the length of survival of the animal on three different levels of riboflavin.

Vitamins of the B complex.—Tumor-bearing adult C3H mice on a pyridoxine deficient diet maintain their body weight and the tumor continues to grow. Addition of pyridoxine to the diet after a 3-week deficient period was not followed by an appreciably increased rate of growth of the tumor.

Adult normal mice lost weight gradually on a diet which approximates a daily intake of 5 γ of thiamin; when additional amounts were added the animals gained weight. Tumors in animals on the completely thiamin-deficient diet continued to grow for 2 weeks and then decreased slightly. Tumors in animals fed the same amount of food containing adequate thiamin responded exactly like those on the deficient diet.

Epidemiology

Incidence studies.—The report on annual cancer incidence, based on a survey of 10 metropolitan areas in northern, southern, and western United States, was completed. This study covers new cases treated for the first time during the study year, cases under observation, deaths, and the frequency of histologic diagnosis. Comparative rates by geographic region are given for each of the major sites of cancer by sex and color, corrected for age distribution. In white males, the incidence of total cancer, excluding skin cancer, was nearly constant in the three regions, whereas the rates for skin cancer were about five times as frequent in the south as in the north. This report makes available for the first time observed incidence rates for comparison with secondary attack rates in cancer.

Therapy of breast cancer.—The evaluation of therapy in breast cancer is part of the studies begun in 1938. Data were drawn from nine hospitals engaged exclusively, or in large part, in the treatment of cancer. The results of treatment of cancer of the breast in the early stage of the disease were as follows:

Initial therapy	Number of traced cases	5-year survival rate
		Percent
Radical surgery	123	69.1
Local surgery	53	47.1
Radiation methods	45	17.8

Collaboration with the Carnegie Institution.—A member of the staff has devoted his full time to directing the construction of the 60-inch cyclotron at the Department of Terrestrial Magnetism, Carnegie Institution of Washington.

Studies contributing to the war effort.—A study was made upon the toxic action of B. B′-dichloroethyl sulfide (mustard gas) by 14 members of the staff. The work has been completed and a report submitted to the Office of Scientific Research and Development. These studies should be of value to the war effort.

Division of Pathology

Senior Surgeon R. D. LILLIE in charge

As a result of the war, greater stress has been given to studies of the pathology of toxic substances, chemotherapeutic agents, and burns.

the improvement of technical materials and methods, and the pathology of certain epidemic diseases.

Toxicologic and Dietary Deficiency Studies

Further study on the administration of sulfaguanidine to rats fed on a purified diet revealed that, in addition to calcification of vessels, lesions developed in the heart, liver, skeletal muscle, and bone marrow. Findings suggest that the myocardial damage is secondary to vascular lesions. Lesions in skeletal muscle resembled those seen in vitamin E deficiency and subsequent study revealed that these muscle changes could be prevented by increasing the amount of vitamin E.

Histochemical studies in relation to the dietary liver cirrhosis of rats were completed. Largely negative results were obtained in the examination of rat tissues for possible toxic effect from phosphate fertilizers and from picric acid.

A study of the toxicology of atabrine in rats given greatly excessive but still sublethal doses revealed extensive and quite striking pathologic changes. Studies of the toxicology of trinitrotoluene revealed lesions in rats, cats, guinea pigs, and rabbits similar to those seen previously in dogs, and not including the subacute yellow atrophy seen in man and attributed to this chemical. Studies were also made on the pathology produced by chemicals used as insecticides.

Studies were made on the histology of burns and of the viscera of burned and scalded animals under a variety of therapeutic conditions.

Studies on Infectious Diseases

In a study of the histogenesis of experimental icterohemorrhagic spirochetosis in albino American deer mice, it was found that the jaundice was not due to cholangeitis with obstruction, obstruction at the ampulla of Vater, or to necrosis of the liver. However, pathologic changes in the liver increase in number of nuclei per cell, swelling and oxyphilia of some Kupffer cells, necrosis of an occasional liver cell, and disruption of liver cords due to loss of cohesion between cells—were such as to suggest that the principal cause of jaundice was dysfunction of the liver rather than hemorrhage or erythrophagia.

A critical study and review of the literature on the histology of human leprosy has been published. A study of the infectivity of strains and species of mycobacteria for the chorioallantoic membrane of chick embryos has been completed, and studies dealing with the virulence of tubercle bacilli are continuing.

Other studies on the pathology of infectious diseases include: Spontaneous and experimental encephalitizoon infection and experimental poliomyelitis, typhus, mumps, kerato-conjunctivitis, pleurodynia, psittacosis, leprosy, Asiatic cholera, trypanosomiasis, ascariasis, pneumonitis, and other virus infections.

Technological Studies

Studies on polychrome methylene blue have resulted in a simplified method of preparation of a Giemsa strain for malaria, with quite constant tinctorial and spectroscopic characteristics. This method is

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now in use in the Naval Medical School. Studies are continuing on the stability of polychrome methylene blue eosinates in solution.

Examinations of stains for certification by the Biological Stain Commission included 12 hematoxylins, 9 Wright stains, 1 Sudan III, 1 Sudan IV, 1 eosin B, 2 anilin blue, 1 Jenner stain, 1 azure, and 5 Giemsa stains. Seven other Giemsa stains were tested for the Naval Medical School.

The amount of experimental material studied showed a 30 percent increase over the previous fiscal year with a total of 5,328 animals. There was an increase in the human surgical material, with 1,696 cases; the number of autopsies decreased slightly. Surgical and autopsy material was received from Marine, Indian, and Prison Hospitals, a Japanese War Relocation Project, and the Florida Farm Workers Health Center.

Division of Public Health Methods

GEORGE ST. J. PERROTT in charge

Health and Medical Services

State quotas of physicians.—This division has handled a considerable part of the statistical work for the Procurement and Assignment Service in connection with the procurement of physicians, dentists, and veterinarians for the armed forces. The work includes the setting up of quotas for the several States and assembling the necessary data for crediting each physician entering the armed forces against the quota of the proper State.

Research was carried on as to the distribution of physicians, dentists, and facilities for medical care. This work has included investigation of the distribution of physicians in the various States and counties in the United States just prior to the war and of the effect upon medical services in States and counties of the withdrawal of men for the armed forces.

Statistics on the patient load of physicians.—Studies of the weekly patient load of private practitioners were made in Maryland, Georgia, and the District of Columbia. This is the first attempt to measure the amount of medical service that physicians are giving and to determine the amount they can give. This knowledge is a prerequisite to the establishment of a rational program of withdrawal of physicians for the armed forces.

Average patient load was found to vary between regions, between rural and urban areas, and markedly between physicians' age-groups. The over-all average patient load fell between 110 and 125. It was estimated that 160 patients per week was the maximum average that a group of physicians under present methods of practice could be expected to see.

Classification of physicians.—At the request of the Procurement and Assignment Service, a system for the classification of physicians as to their essentiality for civilian care was devised in the division. The classification has been made in a number of States under the direction of members of the staff.

Medical schools.—A study has been made of the faculty members of medical schools of the United States, including consideration of

their essentiality in their teaching positions. On the basis of this study, it has been possible to appraise the situation in individual schools and prevent too great withdrawals into the armed forces.

Studies have been made of the medical education program of the Army and Navy, which would result in the enlistment of 80 percent of the future capacity of the schools. The absorption of this high percentage of physicians would leave about 1,500 new physicians a year (women and physically disqualified men) for civilian services, or less than one-half of the number necessary to replace deaths and retirements.

Hospital interns and residents.—Studies have been made of the numbers of medical students to be graduated during the next few years, the number who will be available for civilian and military service, and the way in which the acceleration of medical school programs will affect the staffing of hospitals. Recommendations have been made to reduce to a minimum the alternate over- and understaffing of intern and resident staffs.

Civilian medical care problems.—During September 1942, responsibility for meeting needs for physicians and dentists in war-boom and other areas was assigned by the Federal Security Administrator to the Procurement and Assignment Service of the War Manpower Commission. The division has been active in making surveys and in formulating plans in connection with this program, including the provision of technical assistance to health departments.

Farm Security medical care program.—A statistician on detail from this division has continued to direct the work of reporting on the more than 1,000 medical and dental care units offering care to 115,000 Farm Security Administration clients. These reports provide information on charges and payments for medical, hospital, drug, and dental service provided by these associations and the number of physicians' calls and days of hospitalization received.

Medical and dental supplies.—An economist and a dentist from the division have worked with the Health and Medical Supplies Section of the division of Civilian Supply of the War Production Board to aid in the determination of annual civilian requirements for surgical instruments, dental instruments, hospital equipment, surgical supplies, and other health supplies. Programs were drawn up to assure the fulfillment of essential civilian requirements and programs were instituted calling for simplification in the numbers of sizes, types, or grades of health supplies that could be manufactured. X-ray equipment, physiotherapy equipment, dental burs, and hypodermic needles were some of the health supplies with respect to which simplification programs were instituted.

Postwar planning.—The Chief of the Division has acted as chairman of a committee of the Public Health Service to consider desirable future developments in public health and medical services, sanitation works, and research.

Housing and Health

The Public Health Service continued its cooperative program with the Federal Public Housing Authority. Personnel, including a senior statistician, a sanitary engineer, and a medical care administration specialist, were detailed from the Division of Public Health

Methods to the Central Office of the FPHA to act in a consultant capacity.

The cooperative program of the Service and the FPHA involves the placement of physicians and dentists in war housing projects. Office space is provided doctors and dentists; in certain instances, they are also eligible for housing quarters. The Public Health Service has cooperated with the Procurement and Assignment Service of the War Manpower Commission in obtaining the names of physicians and dentists suitable for these assignments.

Control of Specific Diseases

Tuberculosis.—In cooperation with the National Tuberculosis Association, the Selective Service System, institutions for the training of nurses, and the Division of States Relations, this division has been concerned with the classification of minimal lesions, study of cases found by X-ray examination of Selective Service candidates and student nurses, and the more exact formulation of the present knowledge about the very earliest detectable beginnings of tuberculosis. Investigation has been undertaken of the case-finding efficiency of various sizes of film; the roentgenologist, as a source of error in the interpretation of plates, was evaluated. In the study, plate readings on about 11,000 persons have been taken on 25-millimeter, 4- by 5-inch and 14- by 17-inch X-ray plates by 5 different roentgenologists.

Pneumonia studies.—A general report was published of a 2-year cooperative study of the bacterial etiology of the pneumonias in representative areas of high and low pneumonia-influenza mortality. This is a comprehensive study of factors influencing predisposition to and prognosis in the various penumonias, especially the classical lobar and the primary atypical forms, in influenza, acute bronchitis, and complications of these diseases, including meningitis.

Dental studies.—The dental studies and surveys of the division have been conducted with their immediate applicability to wartime conditions in mind. The finding that tooth mortality is definitely predictable and, under given conditions, to some extent controllable, sheds additional light on the dental status of young adults of both sexes now joining the uniformed services.

Environmental Sanitation

Stream pollution investigations.—Laboratory studies on the waters of Lake Michigan, in the vicinity of Chicago's Dunne Crib intake, were carried on in connection with the Lake Michigan Diversion Problem until September 1942. A report was submitted in November 1942. A critical study was made of the use of brilliant green lactose bile as a confirmatory media for bacteria of the coliform group. Biological studies were made of: (1) Quantity and quality of plankton in reservoirs or lakes used for drinking water at Chicago, Ill., and Dallas, Tex.; (2) causes and extent of "blooming" in the lakes at Madison, Wis., and (3) stream plankton found in samples from several western and southern streams, and from a stream in South Africa.

Sewage and industrial waste treatment.—At the request of the Eighth Service Command, a report, based on a biological survey of 11 treatment plants in Texas, was prepared on the Hays process of sewage treatment. A survey of the biology and a critical study of the bacteria concerned in the activated sludge and Guggenheim processes of sewage treatment, in use at the plant at Ward's Island, N. Y., was made. A confidential report was submitted.

Inventory of sanitation works.—Following publication of the initial summary of water treatment plants in Public Health Reports, November 6, 1942, the mimeographed inventory pamphlets were distributed. The summary was reproduced in the *Journal of the American Water Works Association* and in *Water Works Engineering.* Data on additions and revisions, for the calendar years 1941 and 1942, were solicited and processed.

Emergency health and sanitation.—Six mobile laboratory units have been in service during the year. Four of these trailer laboratories have been engaged on general public health control activities, under assignment to the various Public Health Service Districts during the entire year.

Two special stream sanitation studies have been made—one to determine the effect of increased population due to war industry on a stream used for water supply, and one to determine whether a stream could take the industrial waste discharge of a proposed large war industry without danger.

Munitions wastes study.—Field work on the munitions waste survey was completed in late November. In addition to the observations made in the field, a study of these wastes was carried on in the central labortory. The project included: (1) Studies of the effect of the copper and zinc content of small arms loading plants, on the biochemical oxygen demand of munitions wastes; (2) study of wastes from trinitrotoluene manufacturing plants; and (3) exploratory analysis of wastes from a number of synthetic rubber plants.

Toxic substances in water supplies.—Observations on chemical warfare agents were initiated at the suggestion of the Army Sanitary Corps and the Office of Civilian Defense. Work was done on chloropicrin, chloroacetophenone, and mustard gas. Methods for the quantitative determination of arsenic in water contaminated with chemical warfare arsenicals were also investigated.

Health Statistics

Papers on prewar medical care were published. A paper was published on influenza and pneumonia, with special reference to the declining mortality from these diseases since the beginning of the new therapies including the sulfa drugs. The 4-week summary of the prevalence of important acute communicable diseases in States and the quarterly summary of mortality from important causes continued to appear, as well as a summary of provisional mortality rates for 1942 as a whole.

Division of Zoology

Professor WILLARD H. WRIGHT in charge

Amoebiasis

Culture Studies

The use of cultures of *Endamoeba histolytica* grown with a single species of bacteria (organism *t*) was continued. By prolonging the period of diffusion of reducing and nutrient substances from the egg base and reducing the diffusion of atmospheric oxygen into the overlay, the yield of amoebae per flask was increased from approximately 1 million to 3 million organisms. To test further the effect of gases on the amoebae, a series of Erlenmeyer flask cultures was incubated under oxygen, hydrogen, carbon dioxide, vacuum, and air. In oxygen the growth was retarded, but no significant differences in growth rates were noted under the other conditions of incubation.

Attempts were made to discover a better medium for amoeba cultures. One such medium was made by adding fresh liquid ingredients to egg base that had been used for the growth of a previous culture of amoebae. Attempts to discover the factors lacking in egg white met with considerable success. An enrichment formula was used containing thiamin hydrochloride, pyridoxine hydrochloride, calcium pantothenate, riboflavin, niacin, choline hydrochloride, inositol, p-aminobenzoic acid, biotin, β-alanine, casein, hydrolysate, adenine, guanine, uracil, thymine, salt solution of B. and R. J. Williams, lecithin, and cholesterol.

Diagnosis

A total of 124 experimental antigens and 9 other antigens was prepared for use in the complement fixation test of amoebiasis. Tests with these antigens indicated that the conclusions reported last year were upheld in that these experimental antigens were more specific and potent than antigens prepared by the usual methods. Positive reactions were not obtained in the experimental antigens with serums of cases harboring *Giardia lamblia*, *Endolimax nana*, *Endamoeba coli*, and *Chilomastix mesnili* nor in serums of patients diagnosed as having mucous and ulcerative colitis.

Complement fixation tests for amoebiasis were performed on 266 samples of blood serum submitted by the Army, Navy, and by private physicians. Of these serums, 1 series of 57 was from carrier cases. None of these was positive when a period of one-half hour was allowed for the fixation of the complement. Of the remaining 209 serums, 29, or 13.8 percent, were positive.

Control of Fecal-Borne Parasites

Effect of Sewage Treatment on Parasite Cysts and Ova

Under a contract with the Office of Scientific Research and Development, an investigation was conducted on the effect of various treatment processes on the survival of helminth ova and protozoan cysts in sewage. Hookworm, *Ascaris* and whipworm eggs, and *Endamoeba histolytica* cysts were introduced into sewage in known quantities and examinations were made after treatment to determine the extent of their survival.

Cysts were demonstrated by culture from the upper portions of a sewage-settling tank for periods up to 16 hours. Hookworm eggs were recovered from the upper portions of settling sewage for 2½ hours, but no *Ascaris* eggs were found after 15 minutes of settling. It was concluded that *E. histolytica* cysts and hookworm eggs would be contained in the effluent from settling tanks whereas *Ascaris* eggs would be contained mainly in the sludge.

The standard criteria of efficiency of purification by trickling filters and activated sludge treatment were not of significance with regard to the effect of these processes on helminth ova and amoeba cysts. After treatment, hookworm eggs developed and hatched; *Ascaris* ova developed embryos which remained alive for considerable periods when purification was effective in other respects.

Intermittent sand filtration using a 24-inch layer of sand, with an effective size 0.53 and uniformity coefficient 1.47, effectively removed hookworm and *Ascaris eggs* and *E. histolytica* cysts from sewage when dosed at a rate of 100,000 gallons per acre per day.

Sludge digestion retarded the development of helminth ova but viability persisted for considerable periods. *Ascaris* eggs were capable of development after a year in sludge. Embryonated eggs appeared somewhat more susceptible to anaerobic digestion than did undeveloped eggs. Hookworm eggs remained viable up to 64 days at 20° C. and for shorter times at higher temperatures. There was no evidence that *E. histolytica* cysts survived sludge digestion for comparable periods.

Helminth ova which had previously undergone sludge digestion were also very resistant to sludge drying. *Ascaris* eggs were still viable in cakes dried to a 5-percent moisture content; they survived for as long as 118 days of indoor drying and for 180 days of outdoor drying. Hookworm eggs and larvae developed during drying of sludge and remained alive for periods up to 62 days and until the moisture content had dropped below 10 percent.

Water Chlorination

Experiments were carried out to determine the effectiveness of high-test hypochlorite in killing the cysts of *Endamoeba histolytica* introduced into a natural surface water. The results indicated that the dosage of this substance ordinarily provided for use with a Lyster bag (500 mgms. in 35 gallons of water) is not adequate to kill these cysts within a reasonable time. With the use of the usual dose of calcium hypochlorite, almost half of the cultures, following exposure for intervals up to 150 minutes, were positive for amoebae. The majority of cultures following exposure for periods of 15 minutes and less were positive for the amoebae, almost irrespective of the applied dose of chlorine. Of 640 cultures exposed for 20 minutes or more to a dose 2 to 10 times the usual amount, only 8 were positive. Of 150 cultures exposed for over 15 minutes to a 15-ampoule dose, none was positive for the organism.

Effect of chemical agents other than chlorine.—Several detergent compounds were evaluated with regard to their cysticidal properties. Tests were performed in collaboration with the Naval Medical Research Institute to determine the efficiency of tincture of iodine in killing the cysts. A proprietary iodine-containing compound, releasing considerably more iodine than was added by the use of the

tincture, was found to be more effective than the tincture of iodine, but did not kill all the cysts in 20 minutes.

Some of the factors influencing the passage of cysts through the military portable sand filter units have been determined and methods of operation have been recommended that will aid in removing the *E. histolytica* cysts by the units. Several experimental filters and one captured enemy filter have been evaluated with regard to the removal of cysts. These units use filtering media other than sand and have been found to be much more effective in the removal of amoebae than the sand units.

Insecticide Investigations

A total of 247 chemical compounds was tested to determine their value as insecticides against the body louse. A total of 1,268 *in vitro* experiments was conducted. Weekly tests were carried out with Army underwear sleeves, impregnated with solutions of some of the most promising of the compounds.

A number of compounds and combinations have shown good results in both types of tests. In the *in vitro* tests with impregnated canton flannel, one chemical was killing 90 percent or more of the lice overnight, 86 days after impregnation, and another chemical was still effective 61 days after impregnation. These compounds were used in a concentration of 1 percent in a solvent and are still under test. With higher concentrations of the insecticides, efficacy was retained over a longer period of time. In sleeve tests, in which the lice are introduced into an impregnated sleeve and the sleeve is worn for a period of 3 hours, some concentrations were killing all lice 109 days after impregnation.

Miscellaneous Investigations

Ascariasis.—Studies were carried out on the role of *Ascaris* in the production of pulmonary calcification. Examinations were made of a total of 883 stool specimens and 582 soil samples. In only 1 stool were there ova of *Ascaris lumbricoides*. *Ascaris* ova, however, were found in 68, or 11.7 percent, of the soil samples examined.

Schistosomiasis.—Colonies of species of American snails which are to be tested as possible intermediate hosts of *Schistosoma mansoni* are being reared. A colony of *Australorbis glabratus*, a known intermediate host of this parasite in the Antilles, was started. A monkey infected with *S. mansoni* has been received from Puerto Rico.

Filariasis.—Studies to determine potential mosquito vectors in the United States were initiated.

Division of States Relations

Assistant Surgeon General JOSEPH W. MOUNTIN in charge

The functions of the States Relations Division during the fiscal year were: (1) To administer the emergency health and sanitation program designed to establish and maintain public health safeguards in areas of military and war-industry activity; (2) to aid State health departments in developing adequate State and local public health programs through provision of technical consultation service and financial assistance under the terms of title VI of the Social Security Act; and (3) to prevent the interstate spread of communicable disease by application of quarantine regulations and direct control measures.

A total of $21,221,874 was appropriated for the fiscal year to cover these activities. The emergency health and sanitation appropriation amounted to $9,702,200. The amount available under title VI of the Social Security Act was $11,000,000. Other appropriations to prevent the spread of disease made up the total.

Emergency Health and Sanitation Personnel

During the fiscal year the Service continued the orientation courses established to prepare such new personnel for their public health duties. Three of these 30-day periods of training were held during the year for a total of 182 new employees.

On June 30, 1943, the emergency health and sanitation personnel comprised 4,347 persons, including 160 physicians, 5 dentists, 330 engineers and sanitarians, 127 nurses, 123 specialists and technicians, and 3,602 nonprofessional worker. From this group assignments were made to 44 States, the District of Columbia, Alaska, Hawaii, and Puerto Rico.

Sanitation Activities

The Sanitation Section continued to enforce regulations providing for the safety of drinking and culinary water, milk and food supplies, and general sanitary facilities of common carriers operating in interstate traffic. Supervision of milk and milk products and of food handling on interstate carriers was continued.

Water sources in the United States used by Canadian carriers were certified to Canadian health authorities, who in turn certified Canadian sources used by United States carriers.

Milk and Food Sanitation

Consultation services with regard to milk and food sanitation were rendered by the Milk and Food Unit of the Sanitation Section and by specialists in the district offices. Surveys of milk and restaurant sanitation were conducted in several States, and assistance was given in the organization of State and local milk and restaurant sanitation programs and the training of personnel.

Food and milk sanitation in areas of war activity constituted one of the most serious and difficult problems of health authorities during the year. All possible assistance was given to the Army, Navy, Coast Guard, and State and local health departments in critical

areas in safeguarding eating and drinking establishments and developing adequate supplies of safe milk for the use of the military forces and war-industry workers. Mobile laboratories examined thousands of samples of water, milk, and restaurant utensils in Army maneuver areas and war-industry centers where laboratory facilities were lacking. In addition, a bacteriologist completed a survey of 406 milk laboratories in war areas located in 38 States and the District of Columbia with a view to improving and standardizing procedures. Restaurant and milk sanitation seminars for State and local personnel were held in many places. State and local health departments were also aided in the organization of training courses for food handlers.

On June 30, 1943, the Public Health Service Milk Ordinance recommended for voluntary local adoption was in effect in 992 municipalities and 137 counties located in 37 States and Alaska. In addition, 18 States had regulations based on this ordinance.

At the end of the fiscal year the Public Health Service Restaurant Sanitation Ordinance recommended for local adoption was in effect in 227 municipalities and 133 counties in 29 States and Alaska. It was also used as the basis for State regulations in 17 States.

Public Health Service engineers conducted field surveys of shellfish-producing areas and shucking and packing plants certified by State health departments in order to insure that shellfish shipped in interstate commerce were safe for consumption. Approximately 1,600 State certifications were approved and semimonthly lists of approved dealers were prepared and distributed.

Stream Sanitation

At the request of the Army, the Public Health Service cooperated with the U. S. Army Corps of Engineers in an investigation of the stream pollution problems incidental to proposed flood-control measures and other river developments. Assistance in the solution of stream pollution problems was also furnished to the States of Missouri, Virginia, and North Dakota, to the National Resources Planning Board, and the Tennessee Valley Authority.

Assistance to other Federal agencies.—An engineer was assigned to each of the regional offices of the Federal Public Housing Authority to assist that agency in the selection of suitable sites for housing projects and to give advice concerning sanitation problems encountered in the planning and construction of housing facilities.

As a result of the accelerated shipbuilding program of the War Shipping Administration, the work involved in protecting water supplies of vessels increased sharply. Plans from which "Liberty Ships" are constructed were reviewed to insure safety of the water systems. In addition, the completed ships were inspected and certificates of approval were issued.

The district office engineers and the Sanitation Section rendered inspection and consultation services to the following: The Farm Security Administration and the Forest Service of the Department of Agriculture; the Bureau of Reclamation, the National Park Service, and the Office of Indian Affairs of the Department of the Interior; the Bureau of Immigration and Naturalization and the Bureau of Prisons of the Department of Justice; the Alaska Highway Project; the China Medical Commission; the Office of Civilian Defense; the Office of Foreign Relief and Rehabilitation; the Pan American Sani-

tary Bureau; the Public Buildings Administration; the Power Branch of the War Production Board; and the District of Columbia.

Facilities Security Program

In October 1941 a Coordinating Committee of the Army and Navy Intelligence Divisions and the Federal Bureau of Investigation requested the Public Health Service to become the action agency in connection with the security of domestic water supplies. Executive Order No. 9165, May 9, 1942, directed the Public Health Service to carry on this security task.

Pending appropriation of funds with which to discharge its responsibilities, the Public Health Service made arrangements to have the State engineering staffs undertake the first surveys of water supplies important to the war effort, with the assistance of Public Health Service engineers when necessary. During the year, 549 survey reports were received. These surveys indicate whether or not the plants are staffed and equipped to provide safe, continuous service and to take care of emergencies which may arise. When deficiencies are discovered, they are brought to the attention of the plant authorities and assistance is rendered in bringing about the necessary corrections.

Codes and manuals.—Preparation or revision of the following was completed during the year: Public Health Service Drinking Water Standards and Manual of Operation; Sanitation Manual for Land and Air Conveyances Operating in Interstate Traffic; Rural Sewage Disposal; Emergency Minimum Sanitation Standards Recommended for State or Local Adoption; Shellfish Sanitation Manual. The revision of the Sanitation Manual for Public Ground Water Supplies was virtually completed. The Vessel Sanitation Manual was completed in January 1943, but final adoption and publication were withheld pending decisions as to certain matters of policy.

Public Health Engineering Abstracts was issued monthly during the year except during a period when 3 monthly issues were combined. A total of 1,611 abstracts of current literature from technical periodicals was published.

Malaria Control in War Areas

On June 30, 1943, a force of 3,704 persons was engaged in controlling mosquito production. Control activities undertaken during the year included drainage operations and larviciding in areas contiguous to approximately 1,161 military, naval, and war-industry establishments located in 18 States, the District of Columbia, and Puerto Rico.

Medical, entomological, and engineering aspects of the control program were closely coordinated in order that work might be concentrated in areas where control was most important from the standpoint of the war, and that maximum results might be obtained with a minimum of manpower and materials.

Entomological data recorded during the 1942 breeding season indicate that densities of malaria mosquitoes were satisfactorily reduced in and around approximately 92 percent of the war establishments where control measures were undertaken. The data obtained for May and June 1943 indicate that satisfactory control was being maintained in 94 percent of the control areas.

At the outbreak of the war, very few medical schools in the United States were well equipped for laboratory study of parasitic diseases. In collaboration with the Malaria Investigations Laboratory in Columbia, S. C., men and materials were supplied to make a collection of positive blood smears. Within two months approximately 15,000 slides of the three species of malaria plasmodia were furnished to the Army distribution center, from when they were sent to schools where they were urgently needed to train medical men for service with the armed forces.

Aedes Aegypti Control

After the organization of the Office of Malaria Control in War Areas, responsibility for the existing *aegypti* control programs was assigned to that office. In addition to the programs already being conducted at Charleston, S. C., and Miami, Fla., which served as nuclei out of which operations were later extended to other places, a demonstration eradication program was instituted at Key West, Fla.

At the end of the fiscal year, 11 communities were under survey and incidental control. Except in Key West, where the project was carried on with full mobilization of all the resources that would be employed in the event of an epidemic, chief reliance was placed upon individual and voluntary group effort elicited by means of public education.

The entomological data recorded during the control programs indicate satisfactory reductions in the number of adult *aegypti* mosquitoes. In Key West, the breeding index, *i. e.*, the percentage of inspected premises in which *aegypti* mosquitoes were found, was reduced from 38 percent in June 1942 to about 1 percent in June 1943, with few adult mosquitoes escaping to perpetuate the breed.

Tuberculosis Control

A major project of the Tuberculosis Control Section is case-finding in war industries. The newly developed portable 35 millimeter and 4- by 5-inch photofluorographic X-ray units are used for this work. By the end of the fiscal year, 10 field units were in operation. During the year, chest examinations were given to 320,000 workers in 85 war establishments located in 11 States and the District of Columbia. In addition, 60,000 migratory workers were examined before entering the United States from Mexico.

Tabulation of 125,000 case records showed that 1.3 percent of the workers examined had reinfection-type tuberculosis. On this basis it is estimated that approximately 5,000 cases of significant tuberculosis were discovered.

At the end of the fiscal year requests for case-finding surveys involving more than one million workers were on file in the Tuberculosis Control Section.

At the request of the Chief Medical Officer of the United States Coast Guard, the section undertook to develop a program of routine chest X-ray examination of all Coast Guard recruits. During the fiscal year, all Coast Guard training stations were equipped with 35-millimeter photofluorographic units, and medical officers were trained to read films and assigned to stations where they were needed. Assistance was also given to the Medical Director of the Training Organization of the War Shipping Administration

in the development of a chest X-ray survey program for recruits in the Merchant Marine.

The Public Health Service cooperated with the Army and Navy in a study of the reporting and follow-up procedures used in each State with regard to men rejected for military service. Improved procedures were developed jointly by the Army, the Selective Service System, and the Public Health Service. Much work remained to be done, however, because by the end of the fiscal year only 25 States and the District of Columbia had developed satisfactory follow-up systems.

In addition to more personnel and treatment facilities to care for newly discovered cases, the States need help in developing sound follow-up procedures. With the limited resources at its disposal, the Tuberculosis Control Section was able to make only a beginning in giving the States this type of assistance. At the request of State and local authorities, the tuberculosis control programs of 14 States and 4 cities were appraised, and recommendations were made for reorganization in accordance with wartime needs.

Plague Control

Four fatal cases of human plague occurred in Hawaii and one in northern California. Field surveys and laboratory examinations proved plague to be present in rats in Oakland, Calif., Tacoma, Wash., and Hawaii, and in other rodents in California, Oregon, Nevada, Montana, Colorado, and New Mexico.

Control measures undertaken by the Public Health Service consisted of: (1) Extensive field surveys to determine the location and extent of endemic areas; (2) extermination of rodents in and around military cantonments and maneuver areas in the endemic regions; (3) assistance to State and local health agencies in preventing spread of infection to urban rats and in controlling infection when it did appear in cities; (4) maintenance of a laboratory in San Francisco for the examination of animal tissues and fleas collected by the traveling field units of the Public Health Service and by State health agencies; and (5) identification of animal and insect vectors of plague and determination of epidemiological factors related to the disease.

A finding of significance was the discovery of plague in wild rodents in Union County, N. Mex., the easternmost locality in which infection has been demonstrated to date.

Extermination by poisoning and gassing was carried out at six military reservations in California, Idaho, Oregon, and Washington. The occurrence of infection among rats in Tacoma, Wash., and in the San Francisco Bay area was of particular importance because of the density of population and the concentration of military personnel in and around these places.

During the year, 141,182 rodents and 4,170 specimens of their parasites were collected and examined; 110 specimens were found to be infected with plague and 5 with tularemia. Laboratory examinations were also performed on 8,878 field rodents collected by survey units of the Washington, Oregon, and Montana State departments of health and on 601 collected from ships by the quarantine service at San Francisco.

Typhus Fever Control

The Office of Typhus Control at Atlanta, Ga., continued to cooperate with war communities in endemic typhus areas.

Control measures were designed to reduce the rat population. In carrying out the control program, work was concentrated in the business sections of the communities. Procedures included protection of food in storage, proper collection and disposal of garbage, modified (exterior) ratproofing of buildings, and extermination of rats by trapping, poisoning, and sometimes fumigation.

New programs were established in 12 communities during the year and Public Health Service activity was terminated on 7 projects, either because ratproofing work had been completed or because local personnel were deemed able to continue operation unaided. The population of the communities in which control measures were undertaken varied from 4,000 to almost 400,000.

Provision of Medical Care in War Areas

The Community Medical and Dental Services Section was established in July 1942 for the purpose of developing programs of medical and dental care to meet emergency needs in war areas. The section was not able to carry out the proposed assistance to States for relief of medical care shortages, owing to lack of funds.

Three projects were conducted with funds from the original emergency health and sanitation appropriation.

On October 15, 1942, a medical and a dental officer were assigned to the Florida State Department of Public Health for detail to Valpariso, Fla. A community medical and dental service was established and the Bay Area Health Center was constructed to house the service. Patients, many of whom work at Army airfields in the vicinity, are treated according to a schedule of fees drawn up by agreement with the State health department and the State medical society. Expenses of operating the health center, cost of equipment, and the salary of a nurse are defrayed with money collected from patients. Balances are utilized by the State health department for the expansion of public health activities in the area.

In November 1942, two medical officers were assigned to the Virginia State Department of Health for detail to the city emergency medical service operated in St. Vincent's Hospital, Norfolk, Va. One officer was withdrawn in April 1943; the other will remain until the hospital can obtain someone to take her place.

In December 1942, a dental officer was assigned to the Michigan State Department of Health to render dental service to workers in the Willow Run area near Ypsilanti, Mich.

A cooperative program of joint studies and recommendations with regard to reported shortages of medical care was formally approved by the Surgeon General, the Procurement and Assignment Service of the War Manpower Commission, and the War Participation Committee of the American Medical Association in December 1942.

From January through June 1943, 66 joint studies were made. The recommendations resulting from each study were concurred in by the Public Health Service, the State Procurement and Assignment

Service, the State health officer, and in most instances by the State medical or dental society. Since the Public Health Service could take no direct action on recommendations for the relocation of physicians and dentists, the district offices worked with and through the State chairmen of the Procurement and Assignment Service in an attempt to see that physicians and dentists reached the communities where they were needed.

In January 1943, the Federal Security Administrator approved a policy providing that the Public Health Service might assign medical officers to the Maritime Commission on a reimbursement basis. Three officers were assigned to the Commission for detail to shipbuilding yards in Mobile, Ala., in order to provide medical care for shipyard workers. At the end of the fiscal year one officer was still serving at the Gulf Shipbuilding Corporation in that city.

Dental Health

The States Relations Division is recommending that money granted under title VI of the Social Security Act be used by the States for dental work among high school children and industrial workers. It is felt that dental corrective programs for these groups will reduce the time lost because of dental disease in industry and among men and women of the armed services.

Two States, New Hampshire and New Mexico, established dental programs for the first time. Since enactment of the Social Security Act, 45 States have at one time or another conducted dental health programs. However, with the entry of dental personnel into military service, the number of States conducting dental health programs dropped from 42 to 35 during the fiscal year. As long as the war continues, further curtailment may be expected in this field.

The total amount budgeted by the States from all sources for dental programs during the year was $1,025,794. Title VI funds constituted approximately 10.6 percent of this amount.

Public Health Nursing and Nurse Training

The Nurse Training Program (National Defense)

In order to help meet the urgent need for more nurses, the Congress appropriated $3,500,000 for the continuation and expansion of the nursing education program during the fiscal year 1943. The appropriation authorized the following types of programs: (1) Basic training for undergraduate nurses; (2) refresher courses for inactive registered nurses; (3) postgraduate instruction in the various nursing specialties.

Under this program, tuition scholarships were granted to 5,975 undergraduate students; refresher courses were given to 816 inactive registered nurses in order that they might return to active service; and postgraduate instruction in the various specialties was given to 2,285 graduate nurses.

The extent of Federal aid to nursing education programs during the year, by number and types of programs, increased student admissions, and amounts of funds allotted, is shown in Appendix C, table 1.

National Inventory of Registered Nurses

At the request of the Sub-committee on Nursing, Health and Medical Committee, Office of Defense Health and Welfare Services, a resurvey of all registered nurses in the United States was undertaken in January 1943. Replies to the questionnaire were received from 259,174 registered nurses. No cards were sent to nurses in military service because data concerning them were already available. The inventory revealed 170,599 registered nurses actively engaged in the practice of nursing in the continental United States. Results of the inventory are given in Appendix C, table 2.

As in the past six years, the Nursing Section collected and analyzed information about the number, distribution, and educational qualifications of the public health nurses employed by the States and Territories. Table 3, Appendix C, provides a summary of the information collected for the year 1943.

Community Health and Sanitation Facilities

Hospitals and Health Centers

The Hospital Facilities Section continued throughout the year to handle applications for the various types of projects in the medical category to be constructed under the terms of Public Law 137 (Community Facilities Act). On May 31, 1943, 451 construction projects and 33 service projects in this category had been approved by the President. Total estimated cost of the approved construction projects was $66,000,000; of the service projects, $4,000,000. Progress in construction continued to be discouragingly slow because of material shortages. A check as of July 31, 1943, showed that of the projects recommended by the Public Health Service to the Federal Works Agency for approval, 42 hospital projects (providing 2,567 beds) and 59 health center projects had been completed; 86 hospital projects (providing 7,574 beds) and 16 health center projects were under construction.[1]

Work was continued on the preparation of type plans for hospitals and health centers constructed with Federal financial aid under the terms of the Community Facilities Act, as well as for small hospitals to serve rural areas. The section supervised the planning of 51 hospitals and health centers constructed by the Public Buildings Administration of the Federal Works Agency, which also uses the section's standards to some extent in planning projects not entirely financed with Federal funds.

The War Department requested and received standards and plans for the construction of small hospitals. Plans for infirmaries to serve dormitories and war housing projects and convalescent, maternity, and clinic trailers were also designed for the Federal Public Housing Authority. Under the terms of various War Production Board "limiting orders," all applications for construction of health facilities and the purchase of equipment, such as X-ray apparatus, microscopes and certain laboratory articles, and refrigeration units, are referred to the Hospital Facilities Section for review and recom-

[1] These figures include structures made available by purchase or rental and renovation, as well as through construction.

mendations before priority ratings are issued. During the year, 197 construction project proposals and 13,068 applications for equipment were reviewed.

Sanitation facilities.—Through cooperative agreements with the Federal Works Agency and the War Production Board, the Public Health Service served as the reviewing and certifying agency for sanitation projects submitted to these agencies for approval. During the year, 401 projects for which funds were requested under the terms of Public Law 137 (Community Facilities Act) were reviewed for the Federal Works Agency. In addition, 154 project proposals were reviewed for the War Production Board.

A rural sanitation program providing for protection of private water supplies and construction of septic tanks and sanitary privies was undertaken in cooperation with the Federal Works Agency from July to December 1942.

Financial Aid to States for Public Health Activities

Under the provisions of title VI of the Social Security Act, Congress appropriated the sum of $11,000,000 to enable the Public Health Service to make grants-in-aid to the States for the establishment and maintenance of State and local public health services. During the fiscal year the total amount paid to the States from title VI funds was $10,572,671.87. The distribution of payments, by States, is shown in Appendix C, table 4.

The total amount of funds budgeted from all sources in the cooperative Federal-State-local public health program in the 48 States, 2 territories, Puerto Rico, the Virgin Islands, and the District of Columbia during 1943 was $125,200,874.13 or 5.35 percent more than the amount budgeted during the previous fiscal year. This increase does not necessarily represent additional funds available during the year for public health service, but rather the extension of the cooperative health program to include local communities which had not previously reported their budgets to the Public Health Service. In spite of the establishment of new units in some critical war areas, the progress noted in past years has not been sustained. Acute personnel shortages have resulted in amalgamation of previously separate local units and in expansion of district units to cover more territory. On the whole, the number of counties under some form of full-time service has probably not been substantially reduced but the service is spread thinner than in previous years.

The distribution of funds from all sources budgeted by the States and Territories for various types of public health activities, as well as the ratio of title VI funds to total funds budgeted are shown in Appendix C, table 5.

Development of State merit systems of personnel administration continued satisfactorily despite many complications brought about by the war. At the end of the fiscal year, all but four States and Territories had submitted classification and compensation plans. Sixteen entire classification plans had been reviewed, four had been reviewed in part, and four had been accepted entirely. Acceptable merit system modifications adapted to wartime needs were enacted in a number of States.

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Division of Venereal Diseases

Assistant Surgeon General R. A. VONDERLEHR in charge

All phases of the venereal disease control program were intensified during the fiscal year 1943. As a result of stringent civilian control measures and the vigorous control program of the armed services, it has been possible to avert the sharp increase in syphilis and gonorrhea among soldiers, sailors, and war workers. Such an increase has hitherto been regarded as a wartime inevitability.

The Public Health Service has exerted every effort to strengthen State venereal disease programs. Funds appropriated by the Congress and allotted to the States helped to relieve the hard-pressed and under-staffed clinics which provide epidemiological, diagnostic, and treatment services for persons infected with venereal disease.

Of the $12,367,000 appropriated by Congress for venereal disease control activities during 1943, plus balances accrued from the previous years, $10,170,000, or 81.4 percent, was allotted to the States, the District of Columbia, Alaska, Puerto Rico, the Virgin Islands, and Hawaii. Of this amount, $3,018,900 was earmarked for State cooperation with the armed forces and for other war needs. State and local funds budgeted for venereal disease control were increased by $472,500 over the previous fiscal year, totaling $7,457,100. Funds provided by State and local sources increased from 3.2 cents per capita in 1939 to 5.6 cents in 1943. The total of Federal, State, local, and other funds spent for venereal disease control during 1943 was $19,368,458. (See Appendix C, tables 15 and 17.)

The Service has continued to assign trained personnel to State and local health departments for work in their venereal disease control programs. Approximately 9,000 epidemiological workers are now employed in the 48 States and the District of Columbia on either a full-time or a part-time basis. Training courses have been conducted at the Social Hygiene Clinic in Detroit, the University of Michigan Hospital Venereal Disease Clinic at Ann Arbor, Mich., the City of Isolation Hospital in St. Louis, Mo., the U. S. Public Health Service Medical Center, the Venereal Disease Research Center at Johns Hopkins Hospital, Baltimore, Md., and the University of Pennsylvania. Orientation courses have been held at the Public Health Service headquarters, Bethesda, Md. In these training programs, emphasis has been placed on instruction in rapid treatment therapy, patient education, job placement, management of Rapid Treatment Centers, reports and records. Requests were received from a large number of States for doctors, nurses, and record analysts.

War Activities

Locating the sources of infection of the armed forces, placing these sources under treatment, and holding them to treatment until permanently noninfectious are the most important tasks which face the venereal disease control officer in wartime. Rapid Treatment Centers help solve, to some extent, the problem of case-holding of the mobile transient contacts of the armed forces. But even the most effective

method of case-holding cannot reduce materially the sources of infection unless such sources are located and brought to treatment.

In locating sources of infection, reasonably complete and accurate information must be obtained regarding persons who have presumably infected members of the armed forces and information must be speedily placed in the hands of the responsible health officers. Persons suspected as sources of infection must be immediately followed up and brought in for examination. If infected, they must be held for treatment until permanently noninfectious.

To promote better working relations between civilian health departments and Army venereal disease control officers, liaison officers have been signed by the Public Health Service to each of the 10 Army Service Commands and the Military District of Washington. The liaison officer is in a particularly strategic position to give guidance to Army camps regarding the quality of the interview and report, and to civilian health authorities regarding the effectiveness of follow-up effort.

The Service has cooperated with the armed forces in designing standard report forms and has assisted them in the development of standard procedures in order to get reports into the hands of appropriate health officers as quickly as possible. States in critical war areas have been assisted in the provision of facilities for interviewing soldiers. The Service has established cooperative projects to provide follow-up workers to investigate contacts of the armed forces, bring them in for diagnosis, and hold them for treatment if infected.

The Public Health Service, in cooperation with the American Neisserian Medical Society, held a conference on venereal disease control needs in wartime at Hot Springs, Ark., October 21–24, 1942. Nearly 350 Federal, State, and local civilian health authorities and venereal disease control officers of the armed services met with private physicians specializing in the venereal diseases for an interchange of experience and ideas.

Sessions were devoted to the following subjects: Technics of Venereal Disease Education; Venereal Disease Control Measures Influencing the War Effort; The Epidemiology of Syphilis and Gonorrhea; and Problems Influencing the Wartime Venereal Disease Control Program. Reports were received from committees of the American Neisserian Medical Society, the National Research Council, and a number of other investigatory or research groups.

Rapid Treatment Centers

An outstanding achievement of the year is the network of Rapid Treatment Centers developed by the Public Health Service in cooperation with State departments of health and other public and private agencies. These centers are a logical outgrowth of the 5-year old national control program during which new methods of finding, treating, and preventing venereal diseases have been studied. The accumulation of evidence points to the fact that the greatest source of venereal diseases among the armed forces, war workers, and Selective Service registrants is the prostitute and the promiscuous girl. To quarantine, treat, and aid in redistricting these girls, 30 venereal disease Rapid Treatment Centers were established in the United States, the Canal Zone, Puerto Rico, and the Virgin Islands.

It has been the basic responsibility of the Public Health Service in carrying out the program to provide consultation service to other cooperating agencies and to furnish specially trained physicians, nurses, and technical personnel to operate the centers. Other agencies cooperating with State and local health departments in this work were the Federal Works Agency, the Office of Community War Services, the United States Employment Service, State Boards of Education, the National Youth Administration, and local social agencies.

Under provisions of the Community Facilities Act, Federal funds were made available to assist in maintenance and operation of the centers. As of June 30, 1943, 28 of these centers were operated by State and local health departments and 2 by the Public Health Service. Centers have been strategically located in war areas where the venereal disease problem is a menace to the health of the armed and industrial forces. Former Civilian Conservation Corps camps, National Youth Administration resident centers, and other types of buildings have been utilized.

The centers are in reality special hospitals for the administration of the new types of treatment for syphilis and gonorrhea. The treatment schedules range from 1 day to 8 weeks, as contrasted with the 18 months required by standard syphilis treatment methods. It is thus possible to render a large number of individuals noninfectious with minimum medical and professional personnel. Patients whose treatment requires longer schedules of therapy are often able to perform certain tasks involved in the upkeep of the hospitals. Those who do so are paid a nominal fee for their work. This procedure has been employed not only to make the best possible use of manpower, but also to occupy profitably the time of the patient.

Experimental studies have been carried on at these centers to determine which of the syphilis treatment schedules are most effective and safe. The following were appraised during the year: 1-day fever plus chemotherapy, 5-day drip, the 10–20-day Schoch method, the 10–12-week Eagle, and variations of these.

Sulfathiazole and sulfadiazine have continued to be the drugs of choice in the treatment of gonorrhea. Evidence has been accumulated indicating that the proportion of sulfa-resistant cases has increased, and studies have been undertaken to determine the cause.

Selective Service National "Round-up"

A "National Round-up" of Selective Service registrants with positive blood tests for syphilis was inaugurated toward the close of the fiscal year. The plan was developed by the Public Health Service and the Selective Service System. It permits State health officers to achieve coordinated action between local health agencies and local Selective Service Boards in the task of making available for service a large number of men previously unavailable.

Essential features of the plan include: (1) Rapid medical reclassification by local health officers of each registrant with a positive blood test, and (2) notification of local boards as to the medical availability of the registrant insofar as syphilis is concerned. It is anticipated that a large number of men will be found immediately available for service, either because they have completed minimum recom-

mended therapy or because they were deferred on the basis of false-positive blood tests. Another group, never previously treated or in need of additional treatment, may be subjected to rapid therapy and the induction of this group thus accelerated. Rapid Treatment Centers will be available for use in the round-up plan.

Progress in Syphilis Control

Reports from State and territorial health departments for the first 6 months of 1943 indicate that syphilis control has been greatly accelerated. A total of 590,604 cases was reported to State health departments, an increase of 20.7 percent over 1942. Admissions to clinic service increased from 343,312 in 1942 to 430,302 in 1943, or a net increase of 26.3 percent. The average monthly patient load in clinics increased 11.4 percent during 1943 over that reported in 1942. A total of 12,506,784 doses of arsenicals and heavy metals was administered in clinics, an increase of 17.1 percent over 1942, and 50.4 percent over 1940. Serologic tests in laboratories showed the greatest proportion of increase. Approximately 30,895,328 tests were made in all laboratories, an increase of 53.1 percent over 1942. (See table 15, Appendix C.)

Medical officers have been recruited from areas suffering less acute personnel shortages. They have been trained and reassigned to those States where the need for trained medical personnel was most serious. Altogether 75 venereal disease control officers were assigned to the States during the year by the Venereal Disease Division.

A report of the National Advisory Policy Committee on Social Protection, on the part played by houses of prostitution in the spread of venereal disease revealed that organized commercial prostitution is now less of a problem than are the promiscuous girls and women. These conclusions were substantiated by a recent study of 4,641 records, which showed that the paid prostitute constitutes only one-fifth of the sexual contacts. The noncommercial "pick-up" to whom no fee was paid accounted for 64 percent of the white and 45 percent of the colored sources of infection. The report further indicated that taverns and the street have replaced houses of prostitution.

Progress in Gonorrhea Control

Additional clinical facilities and the enormous increase in the use of sulfonamide drugs have been accompanied by an increase in the number of clinical admissions and average monthly patient load in clinics. The widespread use of sulfathiazole and sulfadiazine which normally do not require the lengthy schedule of older forms of treatment has shortened the required number of treatment visits. Therefore, despite the increase in clinic admissions during the year, treatment visits decreased 46 percent. Some 282,815 cases of gonorrhea were reported to State health departments. More than 23,000,000 sulfonamide tables were distributed by the States, a net increase of 67 percent over the previous year when 13,836,935 were distributed. Laboratory tests showed an increase of 13.9 percent. (See table 15, Appendix C.)

Venereal Disease Research

Research studies were limited to activities specifically related to the prosecution of the war. Studies of the rapid treatment of syphilis and the relative effectiveness of the several sulfonamide drugs were emphasized.

Retrospective study was inaugurated on the intensive therapy of syphilis. Seven thousand treatment abstracts of patients with syphilis treated by various schedules of intensive therapy were pooled for evaluation. The two largest groups of cases were treated by the 5-day slow intravenous drip method and by the 6 to 10-week multiple injection method. Fairly large series are available for the 5-day rapid drip, 7-day multiple injection with and without vaccine-induced fever, and 1-day mechano-fever therapy methods. Comparisons are being made of the frequency of types of reactions, fatal and nonfatal, and clinical results are being evaluated.

The study of gonorrhea in the female was continued with emphasis on three major problems: (1) The improvement of laboratory and clinical procedures for diagnosis and the determination of cure; (2) evaluation of the minimum curative dosage of sulfathiazole as the drug of choice; and (3) development of a simple method for the treatment of patients resistant to two or more courses of sulfathiazole.

The Bellevue Hospital continued its study of the intensive treatment of syphilis; 541 patients with early syphilis received combined mapharsen and fever therapy. The schedule of treatment consisted of 10 daily injections of about 0.06 gram for 10 days and 4 fevers induced by typhoid vaccine. No cases of arsenical encephalopathy have developed.

The Committee on Medical Research of the Office of Scientific Research and Development devoted considerable attention to the study of prophylaxis against syphilis. Agents tested included: Soaps, acids and alkalies, calomel and calomel ointment, and arsenicals. Results no not as yet warrant definite conclusions.

Rapid Evaluation of Sulfonamide Drugs

In January 1943, the Public Health Service in cooperation with the American Neisserian Medical Society undertook a rapid appraisal of sulfamerizine. This analysis was performed at the request of the National Research Council to determine the effectiveness of sulfamerizine with a view to its use in treating gonorrhea in the armed forces.

The evaluation was based on the result of examinations of over 300 cases submitted to the Service by clinics and private physicians. It was clearly established that in the treatment of gonorrhea in the male, sulfamerizine was inferior to either sulfathiazole, sulfapyridine, or sulfadiazine in efficacy, but was slightly less toxic than either sulfathiazole or sulfadiazine.

Field demonstrations and scientific research projects have been continued in cooperation with State and local health departments, universities, and other organizations.

Postgraduate Center, Baltimore, Md.

Research has been continued at the Venereal Disease Research Center at Johns Hopkins University to develop a satisfactory sched-

ule of intensive therapy for syphillis to be used for ambulatory patients. At the close of the year, approximately 3,000 patients had been treated by means of the triweekly schedule developed in that laboratory. The results to date with respect to the therapeutic efficacy and toxic reactions have been gratifying.

Studies have been continued on: (1) The synthesis and testing of compounds for the treatment or prophylaxis of syphilis; (2) the utilization of arsenicals for the treatment of trypanosomiasis; and (3) the treatment of arsenical poisoning by certain compounds found in studies on the treatment of war gas injuries.

Venereal Disease Research Laboratory, Staten Island, N. Y.

In the treatment of sulfonamide-resistant gonorrhea in men, it was found that penicillin sodium gives evidence of being of great value; 74 of 75 patients studied responded in a satisfactory manner, with practically no reaction to the drug.

Studies on the life cycle of the *Spirochaeta pallida* were begun. These have dealt mostly with the production of synthetic media which would allow investigations involving ultraviolet and visual-light photographic studies. It has been possible to maintain the organisms in a viable form for several passages on synthetic media containing practically no foreign particles of a colloidal nature in the background.

Further bacteriological studies of the gonococcus were made, including a study of the reactions of various neiserria on rare sugars, the preparation and evaluation of media, evaluation of various reagents for the detection of the gonococcus, and studies of methods for delayed innoculation or delayed incubation of culture media.

Syphilis prophylaxis in rabbits was studied, using penicillin, arsenicals, and other preparations. The application of electrophoresis to prophylaxis was evaluated. Experimental treatment of syphilis in rabbits with penicillin led to the treatment of four human cases of primary syphilis with the same drug. The patients have shown satisfactory clinical responses with no indication of relapse.

Venereal Disease Medical Center, Hot Springs National Park, Ark.

Postgraduate training in the management and control of venereal diseases was continued. Two 4-week training courses were conducted and 67 certificates of attendance awarded. Six Mexican physicians stationed along the International Border received 6 weeks of intensive instruction. Approximately 75 reserve officers were given training ranging from 4 to 8 weeks.

Treatments given patients, exclusive of baths, were almost double those given the previous year. A total of 55,145 injections of arsenicals and bismuth was given during 1943 as compared to 28,657 during 1942. The laboratories of the Medical Center performed 37,248 serologic tests for syphilis and participated in the National Serologic Evaluation by contributing 5,310 specimens drawn from 90 local donors. Table 19, Appendix C, summarizes the activities of the Medical Center.

Venereal Disease Control in Industry

Wide differences of opinion among labor, management, and civic and health organizations have long been an obstacle to the development of a national venereal disease control program in industry. To clarify the situation and to assemble current authoritative information and to formulate basic principles applicable to the establishment of the program, the Surgeon General appointed an Advisory Committee on the Control of Venereal Diseases in Industry.

The report of the Committee, made on August 10, 1942, pointed out that in its broadest outlines a venereal disease control program in industry involves cooperation between four groups: Employers, employee, medical profession, and State and/or local health departments. In making its recommendations for the implementation of the program, the committee stated the objectives and principles of the program, and recommended the methods to be employed. It advised that responsibility for the administration of the program be shared by the industrial hygiene and venereal disease divisions of the State health department.

Among its recommendations, the committee included a consultation service to industry to be furnished by the venereal disease division. This service should provide detailed information necessary for inauguration of programs in plants, and should include recommendations for specific control measures, diagnostic laboratory procedures, treatment facilities, educational material, epidemiologic and case-holding services and free drug service. The committee recommended that preemployment examinations be mandatory for all workers and that the results of the medical examination be considered confidential between the worker and the medical staff. It was pointed out that a venereal disease control program should not be inaugurated by an industry without a complete educational program.

The report of the committee has been endorsed by the State and Territorial Health Officers' Conference, the medical profession, and management and labor groups, and has resulted in action in 35 States which reported venereal disease control activities in industry for the calendar year 1942. It is expected that a complete report of activities in 1943 will show not only an increase in the number of States with such programs, but also an intensification of industrial venereal disease control activities withn the States.

Educational and Informational Activities

The volume of work increased, but shortage of personnel necessitated the curtailment of those activities which did not bear directly on the war effort. Direct assistance was given the armed services, other Federal agencies, and State health departments in their venereal disease education programs.

Closer correlation has been achieved between education and other phases of the venereal disease control program. Intensive educational programs were conducted in several States. Consultation service and materials were furnished for State-wide venereal disease education programs conducted in Oklahoma, Florida, South Carolina,

and California. The division was active in the city-wide education programs conducted in Seattle, Wash., several cities in California, and in Detroit's tavern-and-poolroom education.

A large amount of material was developed by the Venereal Disease Education Institute at Raleigh, N. C., sponsored by the division, the Zachary Smith Reynolds Foundation, and the North Carolina State Board of Health. Materials were made available at cost to other agencies. Most States and many units of the armed forces purchased quantities of these materials.

More than one million copies of the prophylaxis pamphlet, "It Doesn't Pay," have been distributed since its publication in 1942, mostly for use by the Army, Navy, Maritime Commission, and Selective Service boards.

A new community education film, "Fight Syphilis," was completed; Spanish and Portuguese versions are being circulated in Latin America through the Office of the Coordinator of Inter-American Affairs. With the permission of the Warner Brothers Studios, the film, "Doctor Ehrlich's Magic Bullet," was edited to make an educational motion picture. "Know for Sure" was edited to make it suitable for showing to mixed audiences. A technicolor film was produced for professional education in the diagnosis, treatment, and management of gonorrhea. A series of slides on the clinical manifestations of the venereal diseases was produced in color.

The division continued to publish *V. D. War Letter*, the *Venereal Disease Education Circulars*, and *Venereal Disease Information.*

St. Elizabeths Hospital

WINFRED OVERHOLSER, M. D., Superintendent

The general health of the patient population has remained good throughout the year. Despite shortages of supplies and personnel, every effort has been made to maintain the physical plant in a state of repair. The programs of medical care, professional training, and research have been conducted as nearly in accordance with the standards of St. Elizabeths Hospital as increased demands upon our diminished personnel have permitted. Food rationing caused certain reductions in the diet of the patients, but such reductions have been consistent with adequate nutrition and palatability.

The number of admissions increased substantially, while the number of physicians, ward personnel, and other employees decreased. The Surgeon General of the Navy has been most helpful in detailing to the hospital medical officers and corpsmen for training and for assistance in the care of patients. Despite the substantial increase in admissions, the daily average number of patients under care increased by only 37 over last year, reflecting an increased rate of discharges.

There is every reason to believe that a still greater increase will materialize before many months have elapsed. The armed forces are soaring rapidly in size, and the rate of incidence of mental disorder may be expected to increase as hostilities expand. The hospital, which has survived three wars already, is prepared to do all in its power to meet the demands of total war.

The new Continued Treatment Buildings Nos. 7 and 8 are practically completed and will be opened for patients during the next month or so. These buildings will accommodate 500 beds. This will increase the number of patients who can receive treatment.

The pressure of work upon the staff is increasing, both actually and relatively. More patients are being received, the turn-over is becoming more rapid, and the number of physicians and of ward personnel is tending to diminish. Many of the wards are seriously undermanned, and none is ideally provided with supervision. Under such circumstances, standards are bound to be strained. The staff and employees have worked harder than ever before, but without complaint, realizing that the exigencies are the result of the war. The patients have been understanding when the necessary limitations of the diet or ward supplies were explained to them. Finally, the relatives of patients have been most tolerant and sympathetic in the face of difficulties due to the shortage and inexperience of personnel. In short, the citizenry realize that in a war all must put up with inconvenience and sacrifice; this is a sign of healthy morale. It is a pleasure to the superintendent to express his deep appreciation of the helpful and cooperative spirit of the staff and emloyees, the patients and their relatives in these difficult times.

To the various veterans' organizations, to the Army, Navy, and Marine Bands, and above all to the American Red Cross, the hospital extends its profoundest gratitude for the invaluable services rendered to the patients. Finally, to the Surgeon General of the Public Health Service and to the administrator of the Federal Security

Agency, the Board of Visitors and superintendent express appreciation of their support and sympathetic understanding.

Movement of Population

The total number of patients under treatment during the year was 9,099 as compared to 8,680 in the preceding year. Admissions in 1943 totaled 2,324 as compared to 1,797 in 1942. This was the largest number of admissions in any year in the history of the hospital. In addition, 973 patients over which the hospital had no jurisdiction were admitted to the Public Health Service Hospital at Fort Worth, Tex. On June 30, 1943, 7,188 patients remained on the hospital rolls, as compared to 6,775 on June 30, 1942.

The total number of discharges was 1,149 as compared to 1,134 discharges (exclusive of 400 transfers to the Public Health Service Hospital, Fort Worth, Tex.), in 1942. There were 420 deaths among the patient population during the year as compared to 371 for the preceding year. The daily average patient population was 7,031, as compared to 6,994 the previous year. This small increase is principally accounted for by the fact that as the hospital population has increased, the number of discharged patients also increased. The discharge rate in relation to the admission rate was 64.15 percent, an increase of 1.05 percent over the preceding year.

Heretofore, by far the largest number of patients was admitted from the District of Columbia, but during 1943 less than half, or 1,054, were from the District, while 918 were from the Navy, 126 from the Marine Corps, and 36 from the Coast Guard.

The movement of the patient population during the fiscal year is shown in Appendix C, table 23.

Medical Department

Twenty-six physicians formerly on the medical staff are being carried on military leave. The work of the remaining medical staff has been seriously affected by the time given to the examination of selectees at the Induction Center at Fort Meyer, Va.

During the year, 291 cases were presented at general conference; 136 of these were discharged. In addition, 332 patients were discharged while on visit or elopement.

Throughout the year, it has been difficult to maintain vacancies for incoming patients. Crowded conditions on all services frequently necessitated two or three moves before the proper ward for a given patient was found. It has been extremely difficult to classify and distribute the patient population properly. Vacancies exist on the the quieter wards or on paroled wards, while space is usually needed for the more disturbed type of patient.

Every effort was made to reduce the number of injuries occurring in the service. All reports of injuries were carefully checked and discussed with the physician-in-charge. Appropriate action was taken, wherever possible, to prevent a recurrence.

The principal problems confronting Clinical Division No. 1 were lack of bed space, shortage of medical personnel, and insufficient and inadequate ward personnel. The reduction of the internship from 2 years to 1 has been detrimental to the work of the psychiatric serv-

ice. Under this arrangement, interns devote only 2 months to psychiatry instead of 6, so that just as an intern has become acquainted with the routine of the psychiatric service, he leaves the department to be relieved by another inexperienced man. During August, there was only one resident on duty in both psychiatric divisions of the hospital. Only the assistance given the hospital by the Navy assignments has made possible the carrying on of the merest psychiatric routine. However, Navy assignments, while useful, are not a satisfactory solution to the problem. They are assigned for temporary duty only and can give only about half of their time to the psychiatric service, since they are at the hospital actually for instruction.

A total of 192 beds has been added, but the increase in ward personnel has not been proportional. The problem of securing ward personnel has become crucial as experienced charge men and attendants with many years of service have left to enter the military organizations or have obtained more lucrative positions in other governmental departments. The hospital has been forced to employ a larger percentage of inexperienced employees, many of them of an inferior order. Since the 48-hour week has been in effect, there has been an increase in absenteeism of 2 or 3 days duration. Shortage of personnel makes it impossible to grant extended leave.

The Medical and Surgical Service

The Medical and Surgical Service had vacancies for a resident surgeon, resident internist, and an average of 20 registered nurses and 15 attendants during the year. A dental technician, an X-ray technician, a syphilologist, the supervising nurse of the service, and the head nurse of the clinic service have been temporarily replaced. It has been impossible to replace the anesthetist. The physiotherapy department lost 2 of 3 physiotherapy aides, so that at times that department has to be closed for lack of personnel.

The service has cooperated with the Medical Corps of the United States Navy, with the United States Public Health Service, and the Office of Strategic Services in certain medical research problems.

The blood-bank organization volunteered to collect blood in January and February for the local Office of Civilian Defense organization, accommodating 265 donors. In the middle of March, it began to serve donors for the Red Cross Blood Bank, and between that date and June 30 accommodated over 1,000 donors.

The clinics continued to operate as usual. The number of admissions to the ward was 2,433, and the number of clinic visits was 41,332. The service laboratory made 8,161 examinations.

Receiving Service

The large increase in admissions to the Men's Receiving Service has necessitated extra admission conferences. All of the patients are, as is usual, being seen within a month after they enter the hospital. It is undesirable to see most of the patients sooner because of lack of completed special examinations and histories from other sources. An increasing number of patients seen at these conferences has been followed up psychotherapeutically, many of them at their own request.

Psychologists have made 468 psychological examinations—384 of patients, 41 of student nurses, and 43 of employees, applicants for positions, and interns.

Social service.—Patients supervised by the social service totaled 495. Two hundred and forty histories were obtained; service was rendered 368 inpatients; and 289 visits were made for the purpose of surveys preparatory to the contemplated release of patients.

Libaries.—The medical library was increased by 275 volumes, 119 of which were purchased, making a total of 11,789 books in the medical library. Pamphlets, including reprints and annual reports, are estimated at 6,300. The library received 99 periodicals.

The patients' library increased by 1,429 volumes; 148 were new books purchased by the hospital; the rest were donated. The library now contains 21,122 volumes. Approximately 4,800 books were circulated among the patients each month, 65 percent of them fiction. Special efforts were made to interest patients on the disturbed wards in reading. Patients assigned to the library for occupational therapy have assisted in the repair and binding of 486 books and in other library tasks.

Occupational therapy.—There were 1,012 new admissions and 218 readmissions to the occupational therapy department. More than 1,200 articles were made for the sewing room and nearly 1,000 for occupational therapy. More than 290 articles were mended. At Christmas time, 2,484 tarlatan bags were made and distributed to women patients of the hospital. The Red Cross furnished similar gifts to the male patients.

School of nursing.—A total of 152 students was enrolled in the school, 44 of them affiliate students. Schools affiliating with St. Elizabeths for psychiatry are: Sibley Memorial, Garfield Memorial, Providence Hospital, and Freedmen's Hospital in Washington, D. C., and the Hackensack Hospital, Hackensack, N. J. Twelve students were graduated, 4 of whom passed the examination of the District Examining Board with honors. During the year, 29 students received affiliated training at the Jersey City Medical Center, Jersey City, N. J.

Laboratory

Members of both the clinical and laboratory staff have taken part in research work. Research activities included the following:

1. Preservation of the red blood cells derived from the plasma banks.
2. Carbonic anhydrase in the central nervous system.
3. Electroencephalograph studies on: Artificial EEG; multiple sclerosis; narcolepsy; double proencephaly; hormonic analyses of waves; EEG before and after electric shock treatment.
4. Rapid technic for differentiation of nerve cells.
5. Biochemical and hematological studies.
6. A method for the determination of barbituric acid in blood.
7. Analyses of blood taken from schizophrenic patients with the object of studying more directly brain metabolism.

Material was prepared for the scientific exhibits of the annual meeting of the American Psychiatric Association held in May 1943.

Administrative Department

Supplies.—Large amounts of vegetables, milk, eggs, poultry, and pork were produced on the hospital reservation, farm, and garden as well as quantities of forage. The amount of milk produced dropped from 277,463 gallons in 1942 to 233,127 gallons in 1943, while

the delivery of fresh pork was the highest in the history of the herd, 192,376 pounds. The production of the poultry flock was 10,833 pounds of meat and 26,294 dozens of eggs, a record for both items. The dairy pasteurized 233,127 gallons of milk and bottled 1,200 quarts daily. The remainder was canned for use in the kitchens and for making ice cream. In addition to the milk produced in the hospital, 79,340 gallons of milk were purchased. An average of 25 gallons of buttermilk was made daily and the ice cream department manufactured 32,981 gallons of ice cream were manufactured.

In the shoe shop, 5,633 pairs of shoes and 77 belts were made; 3,335 pairs of shoes were mended. The matress shop produced 2 double mattresses, 2,821 single mattresses, and 1,937 pillows. The broom shop made 5,390 brooms and 84 whisk brooms.

The sewing and mending rooms of the hospital made 42,324 garments for men, women, and children, and produced large quantities of other articles such as sheets, tablecloths, bath towels, tea towels, pillow ticks, and so forth.

Laundry.—The number of pieces laundered, dried, and ironed was 15,265,660, an increase of 586,617 over the previous year. The laundry is overcrowded, and in the summer the heat and humidity are such that it is almost inhuman to expect patients and employees to work under such conditions. Unfortunately. it was impossible to erect the projected new building.

Culinary department.—Increase in patients and rationing combined to make the work of this department heavier. Owing to shortage of help and rationing, it was found necessary to limit the number of people who could be served in the employees' cafeteria to hospital employees, their relatives, and patients' visitors. The bakery increased its output of bread by 117,414 loaves and 98,700 rolls.

Classes in nutrition and diet therapy were given under the supervision of the dietetic department. There were 84 students in the nutrition classes and 68 in the diet therapy sections.

Garage.—A total of 42,632 patients was transfered by bus and ambulance from various buildings about the hospital grounds. Passenger and truck service was rendered daily, and hauling was done for the laundry department. The amount of gasoline used for passenger service was reduced by 40 percent over the previous year.

Personnel.—The total number of employees in the hospital on June 30, 1943 was 1,984, a decrease of 70 from the prior year. This decrease together with 173 employees on furlough status while serving in the armed forces, brings the total number of employees on duty to 239 less than the number on duty at the end of 1942.

There were 755 appointments during the year and 825 separations. Nineteen employees were retired on account of disability; there were 10 optional retirements. Two employees, Mr. Alvah Godding, superintendent of lawns and gardens, and Mr. Daniel J. Sullivan, chief of commissary, were retired on account of age.

Purchases.—Supplies amounting to $1,257,452.18 were ordered. Of this amount, $470,788.99 were for 331 formal contracts (over $100) negotiated by the hospital. No unusual construction items were included in these amounts.

Owing to war shortages of essential foods, the recommendation was made through the Federal Security Agency to Congress, and a law was

passed permitting the use of butter substitutes when butter cannot be secured for table use.

Financial office.—During the year disbursements approved by the financial office amounted to $5,083,650.82 on a total of 2,797 vouchers. Collections received and deposited amounted to $3,118,221.13. Purchase orders posted and passed through the accounting office numbered 2,758; bills from vendors checked prior to vouchering, 4,384; job orders priced, 16,750; collections on 11,200 items; deposits made in the treasury, 235; vouchers prepared for withdrawals from patients' accounts, 1,767; vouchers paid in cash by agent-cashier, 794; and postings made to individual patients' accounts, 36,600.

Chief Clerk's office.—In the stenographic office, 22,568 letters were written, 18,898 dictaphone cylinders were transcribed, and 2,317 patient histories were written.

Guard force.—The guard force has continued to function efficiently, keeping order and preventing losses. Several investigations of reports of minor thefts were made during the year.

Fire department.—Regular inspections of the hospital were made by the fire marshal and by the District of Columbia Fire Department. There were 33 fire alarms, the property damage amounting to $287.93. The approximate loss from fires from June 19, 1917, to June 30, 1943, was $36,957, which includes the $26,000 Red Cross Building fire.

Two Burrell All-Service gas masks were installed on the hose wagon at the garage. All fire extinguishers, approximately 1,044, were tested, inspected, and refilled; 91 fire hydrants were tested and inspected and repairs were ordered when needed. Five additional fire hydrants were installed. Equipment was tested regularly.

Legislation

It is recommended that legislation be enacted looking toward the treatment of the continental mentally ill in the Philippine Islands. Legislation is also recommended to give expatriated American citizens who may become mentally ill in other countries the right to be received in St. Elizabeths Hospital for treatment when their State residence is not known, as provided in existing legislation in reference to American citizens residing in Canada.

In Title 24 of the United States Code, Section 191, the second provision directs that civilians employed in the Quartermaster Corps of the Army, who may become insane, are entitled to receive treatment in St. Elizabeths Hospital. When this provision was enacted, the Army did not have an air corps, a tank corps, or a motor transportation corps. No provision has been made for civilian employees of these branches of the services. It is recommended that provision be made to permit such employees to receive treatment in St. Elizabeths Hospital.

It is suggested that there be legislation permitting family care of the patients of the hospital. This law would permit the transfer, under hospital supervision and direction, of patients to families in the neighborhood, and particularly in the rural districts, to work on farms. The hospital would pay a limited amount for the support and care of such patients. The social workers would make regular inspections.

Appendices

Appendix A

Appendix A contains tabular statements of expenditures from appropriations of the Public Health Service for the fiscal year 1943.

Table 1.—*Statement of net total obligations, 1943*

Appropriation	Appropriated	Received by transfer	Reserve	Available for obligation	Expenditures		Unobligated balance
					Direct obligations	Transfer to other appropriations	
Salaries, Office of Surgeon General	$473,750			$473,750.00	$471,918.98		$1,831.02
Pay, etc., commissioned officers	2,497,590	[1] $462,260.00		2,959,850.00	2,935,524.25		24,325.75
Pay of personnel and maintenance of hospitals	11,868,950	[2] 1,792,775.48		13,661,725.48	13,654,184.93		7,540.55
Foreign quarantine service	1,234,250			1,234,250.00	1,223,645.20		10,604.80
Preventing spread of epidemic diseases	198,780		$40,000	158,780.00	156,377.88		2,402.12
Interstate quarantine service	26,300			26,300.00	26,174.99		125.01
Expenses, Division of Venereal Diseases	12,500,000	[3] 171,901.75		12,671,901.75	11,541,217.12	[4] $272,212	[5] 858,472.63
Expenses, Division of Mental Hygiene	1,322,600	[6] 436,331.00	25,000	1,733,931.00	1,724,466.41		9,464.59
Disease and sanitation investigations	1,511,080	[7] 15,000.00		1,526,080.00	1,315,202.33	[8] 147,588	63,289.67
Maintenance, National Cancer Institute	534,870		15,000	519,870.00	481,063.25	[9] 2,000	36,806.75
Working capital fund		[10] 265,929.73		265,929.73	191,635.48		74,294.25
Miscellaneous and contingent expenses	185,275	[11] 2,500.00	5,000	182,775.00	173,843.98		8,931.02

[1] $106,883 from Department of Justice; $142,212 from expenses, Division of Venereal Diseases; $147,588 from disease and sanitation investigations; $53,686 from emergency health and sanitation; $6,822 from Pan American; $5,069 from State Department.

[2] $1,371.79 from Office of Price Administration; $63,797.05 from Coast Guard; $154,703.83 from Navy Department; $99,826.25 from War Department; $15,439.77 from Federal Works Agency; $1,192.99 from Office of War Information; $37,293.39 from Employees' Compensation Commission; $12,601.80 from Treasury Department; $7,308.75 from Civilian Conservation Corps; $3,020.25 from National Youth Administration; $4,525.94 from Labor Department; $1,601.22 from Bureau of the Budget; $46,409.45 from Department of Justice; $2,073.40 from Department of Commerce; $939,011.25 from Veterans' Administration; $207,141.67 from War Shipping Administration; $187,785.00 from emergency relief employees; $2,387.50 from Panama Canal; $1,690.10 from War Production Board; $3,594.08 from miscellaneous.

[3] $171,901.75 transferred from fiscal year 1942.

[4] $130,000 to traveling expenses, Federal Security Agency; $142,212 to pay, etc., commissioned officers.

[5] $844,942.58 transferred to fiscal year 1944.

[6] $436,331 reimbursements from pay patients.

[7] $15,000 from Navy Department.

[8] $147,588 to pay, etc., commissioned officers.

[9] $2,000 to Bureau of Standards, Department of Commerce.

[10] $62,835.67 balance July 1, 1942; earnings $203,094.06.

[11] $875 transferred from miscellaneous expenses, Freedmen's Hospital, Federal Security Agency; $1,625 transferred from miscellaneous expenses, Freedmen's Hospital, District of Columbia.

Table 1.—*Statement of net total obligations, 1943*—Continued

Appropriation	Appropriated	Received by transfer	Reserve	Available for obligation	Expenditures		Unobligated balance
					Direct obligations	Transfer to other appropriations	
Emergency health and sanitation activities, National Defense	$9,702,200	[12] $41,548.51	-------	$9,743,748.51	$9,478,328.12	[13] $53,686	$211,734.39
Training for nurses, National Defense	4,109,000	[14] 1,180,631.95	-------	5,289,631.95	4,482,826.45	----------	806,805.50
Salaries and expenses, National Defense	50,000	----------	-------	50,000.00	47,100.04	----------	2,899.96
Salaries and expenses, National Institute of Health	822,600	----------	-------	822,600.00	812,583.50	----------	10,016.50
Total	47,037,245	4,368,878.42	85,000	51,321,123.42	48,716,092.91	475,486	2,129,544.51
Grants to States, Social Security Act	11,000,000	[15] 27,005.21	-------	11,027,005.21	10,572,671.87	----------	[16] 454,333.34

[12] $16,300 transferred from Treasury Department; reimbursements, $1,396.57 from Office of Lend-Lease Administration; $2,474.36 from Maritime Commission War Shipping; $1,353.18 from Department of State; $13,733.40 from Farm Security Administration; $3,066 from Office of Administrator, Federal Security Agency $3,225 from Public Health Methods.

[13] $53,686 to pay, etc., commissioned officers.

[14] $1,180,631.95 transferred from fiscal year 1942.

[15] $27,005.21 transferred from fiscal year 1942.

[16] $454,333.34 transferred to fiscal year 1944.

Table 2.—*Funds made available from other sources, 1943*

Appropriation	Available	Direct obligations	Transfer to appropriations	Balance
Medical and hospital service, penal institutions	$826,559.00	$784,592.57	----------	$41,966.43
Community facilities, defense public works, Office of Administrator, Federal Security Agency	139,730.00	10,260.57	----------	129,469.43
Cooperation with the American Republics	30,000.00	28,393.18	----------	1,606.82
Salaries and expenses, immigration and naturalization service	29,300.00	27,353.40	----------	1,946.60
Working fund, Federal Security Agency, Public Health Service, (emergency management)	31,889.23	10,075.29	----------	21,813.94
Working fund, Federal Security Agency	1,530,704.98	1,377,914.79	----------	152,790.19
Emergency fund for the President	291,257.12	192,893.63	----------	98,363.49
Emergency relief	8,350.00	7,637.00	----------	713.00
Total	2,887,790.33	2,439,120.43	----------	448,669.90

Table 3.—*Miscellaneous Receipts, 1943*

Source	Amount
General fund receipts:	
Fees:	
Commissions on telephone pay stations in Federal buildings outside of Washington, D. C.	$6,621.84
Copying	6.00
All other fees of courts not collected by clerks or marshals	3.24
Fines and penalties: Public Health Service	1,030.00
Interest, exchange, and dividends: Interest on deferred collections or payments	267.36
Permits, privileges, and licenses: Business concessions	7,780.40
Reimbursements:	
Excess cost over contract price	44.10
Excess witness fees	6.60
Government property lost or damaged	1,868.49
Hospitalization charges and expenses	198,836.06
Jury service	98.00
Refund on empty containers	5.00
Transportation	24.47
Other	441.39
Rents and royalties: Rent of public buildings and grounds	[1] 1,244.23
Sales of Government property-products:	
Livestock and livestock products	2,368.95
Occupational therapy products	1,177.14
Scrap and salvaged materials, condemned stores, waste paper, refuse, etc	8,775.85
Subsistence	33,312.89
Sales of services:	
Quarantine charges	103,666.79
Quarters	17.17
Quarters, subsistence, and laundry service	60.00
Nonrevenue receipts:	
Repayments of investments: Repayment and recoveries, Emergency Relief, Act Dec. 17, 1941	1,335.00
Sales of Government property: Capital equipment	2,265.92
Total	368,768.43
Trust fund receipts:	
Nonrevenue receipts:	
Collections, leper patients' benefit fund, U. S. Marine Hospital, Carville, La. (act June 26, 1934)	$346.00
Contributions to National Cancer Institute, unconditional gift fund (act Aug. 5, 1937, 50 Stat. 561)	21.00
Contributions to National Institute of Health, acts May 26, 1930, 46 Stat. 379 and June 26, 1934, 48 Stat. 1234: Conditional gift fund	8,500.00
Interest on investments, National Institute of Health (acts May 26, 1930, 46 Stat. 379 and June 26, 1934, 48 Stat. 1235: Conditional gift fund	3,357.50
Deposits, erection or support of hospitals for sick and disabled seamen, Federal Security Agency	5,000.00
Deposits of personal funds and earning of inmates, narcotic farm, Public Health Service (acts Jan. 19, 1929, and June 26, 1934)	94,467.69
Proceeds from effects and moneys of former patients, Public Health Service (decision of Comptroller General dated Oct. 29, 1928)	3,397.84
Total	115,090.03

[1] Excess of credits, deduct.

Appendix B

Appendix B contains a consolidated statement of the personnel of the Public Health Service for the fiscal year 1943.

Table 1.—*Consolidated quarterly personnel report for quarter ending July 1, 1943*

[Prepared from records in the Division of Personnel and Accounts]

U. S. Public Health Service	Regular corps							Reserve corps					Noncommissioned personnel																		Totals			
	Surgeon general	Assistant surgeon general	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Acting assistant surgeon	Attending specialists and consultants	Contract dental surgeons	Interne	Pharmacist	Administrative assistant	Assistant collaborating epidemiologists and collaborating epidemiologists	Druggist	Aide (P. T. and O. T.)	Dietitian	Nurse	Scientific personnel and hospital laboratorians	Pilot	Marine engineer	Sanitary inspector and fumigator	Clerk	Departmental personnel (regular)	Temporary emergency workers	Attendant	All other field employees	Commissioned officers (regular and reserve)	Noncommissioned employees	Sub (or station total)	Grand (or division total)
Administrative and departmental	1	8	7	8	5	4	6																						519				39	519	558	558
FIELD																																				
Hospital division																																				5,747
Marine hospitals:																																				
Baltimore, Md			1	1	8	3	1				3	6	4	29		9		1		1	4	5	79	10				33			124	65	23	364	387	
Boston, Mass			2		2	4	3				3	6	2	39		12		1		1	2	3	56	10				25			124	50	20	325	345	
Buffalo, N. Y			1		1							2	4	10			1	1			1		11	1				7			25	7	4	68	72	
Carville, La				1									7	3		2				1	4	1	15					11			203	106	1	353	354	
Chicago, Ill				1	3	2					3	3	5	21		6	1	1			1	2	32	6				15			66	44	12	200	212	
Cleveland, Ohio			1		1	1	1				1	4	8	10		2	2			2		2	36	6				14			64	33	10	179	189	
Detroit, Mich			1	1	3		1				2	9	3	16		4	2	1			2	2	39	8				17			78	29	18	201	219	
Ellis Island, N. Y			1	2	1	3					1	7	6	6		1	2				1	5	58	2				14			156	49	13	300	313	
Evansville, Ind						1						2		10				1					10					4			27	14	4	67	71	
Ft. Stanton, N. Mex				1		4						4		3				1		1	3	2	12					8			34	73	9	137	146	
Galveston, Tex				1	3	1					2	1	2	16	1	1	1	2				3	23	3				9			52	28	8	141	149	
Hudson Street, N. Y			1	1	3		1				1	10	18	14			1	1			10		10	4				21			15	32	17	126	143	
Louisville, Ky				2	1	1					1	1	2	15	1	2	1					1	17	3				8			35	21	6	106	112	
Memphis, Tenn					3								1	16	1	1		1		1	1	1	16	2				7			40	21	3	109	112	
Mobile, Ala				1		1	1					6	1	9		1		1			1	1	23	3				7			55	17	9	119	128	
New Orleans, La			1	1	5	3	1				1	7	3	17		20	2	1		1	3	4	58	14				26			162	58	19	369	388	

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Table 1.—*Consolidated quarterly personnel report for quarter ending July 1, 1943*—Continued

[Prepared from records in the Division of Personnel and Accounts]

U. S. Public Health Service	Regular corps							Reserve corps						Noncommissioned personnel																		Totals			
	Surgeon general	Assistant surgeon general	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Acting assistant surgeon	Attending specialists and consultants	Contract dental surgeons	Interne	Pharmacist	Administrative assistant	Assistant collaborating epidemiologists and collaborating epidemiologists	Druggist	Aide (P. T. and O. T.)	Dietitian	Nurse	Scientific personnel and hospital laboratorians	Pilot	Marine engineer	Sanitary inspector and fumigator	Clerk	Department personnel (regular)	Temporary emergency workers	Attendant	All other field employees	Commissioned officers (regular and reserve)	Noncommissioned employees	Sub (or station total)	Grand (or division total)
Scientific Research Division National Institute of Health (administration)—Continued.																																			
Division of Industrial Hygiene			1		5	1	4		1	7	14	32	2	29										133				28			8	65	200	265	
National Cancer Institute			1		1	2	1				1	2	2	8				1					1	121				11			36	8	180	188	
Cooperative projects														6									3										9	9	
All other activities			1	5	3	2	3		3	6	2	1		1										31				2				26	34	60	
Division of Sanitary Reports and Statistics														5					4,462																
Division of Venereal Diseases				5	12	23	15	1		9	32	26	20	87			1	26		1			100	55				520			93		4,560	4,560	4,560
Division of Mental Hygiene																															6	337	123	1,153	1,276	1,276
Alcatraz Island, Calif										1		1	3	1										3											1,346
Alderson, W. Va						1							8										7	1							3	2	10	12	
Atlanta, Ga										2	2	3	2	7				1					2	4								1	16	17	
Chillicothe, Ohio				1		1	1					2	1	5		1		1					2	5				1			4	7	16	23	
Forth Worth, Tex			1	1		4	6					3	1	6				3		2	3	3	21	6				34			5	5	20	25	
Seagoville, Tex										1			2	10									10	2				2			11	255	15	339	354	
La Tuna, Tex													4	5										2								1	37	38	
Leavenworth, Kans					1	1					2	2	2	6				1					2	2								2	13	13	
Lexington, Ky			1	1	4	4	2				1	4	2	12			2	4		2	5	3	17	13				46			17	290	17	413	430	
Lewisburg, Pa					1		1				3	1	1	10		1							2	3				1				3	6	21	27	
McNeil Island, Steilacoom, Wash					1						2	2		4									2									1	5	7	12	
Milan, Mich					1		1					1	2	4										1								1	3	8	11	
New Orleans, La																																			
Petersburg, Va							1					1	3	4										3				1				3	2	14	16	
Springfield, Mo			1	1	2	3					1	7	1	7		1					2		4	4							137	15	156	171	

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Table 2.—*Number of commissioned officers (regular corps), active reserve officers, and other medical, dental, sanitary engineer, and allied personnel, on duty July 1, 1942, and July 1, 1943*

Regular officers	July 1, 1942		July 1, 1943	
	Active	Waiting orders	Active	Waiting orders
Surgeon General	1	1	1	1
Assistant Surgeon General	8		8	
Medical director	46	37	61	39
Sanitary engineer director		1	5	1
Dental director			1	
Pharmacologist director	1		1	
Senior surgeon	41	6	68	6
Senior dental surgeon	11	1	15	1
Senior sanitary engineer	14		10	
Surgeon	65	13	122	12
Dental surgeon	9		33	
Sanitary engineer	5		9	
Pharmacist			3	
Passed assistant surgeon	185	6	137	6
Passed assistant dental surgeon	29	2	5	2
Passed assistant sanitary engineer	8		7	
Passed assistant pharmacist	4	2		3
Assistant surgeon	92		97	
Assistant dental surgeon	1	1	6	1
Assistant sanitary engineer	4		8	
Total	524	70	597	72

RESERVE OFFICERS (ACTIVE DUTY)

Grade	July 1, 1942	July 1, 1943
Medical director	1	2
Senior surgeon	20	23
Senior engineer	3	3
Senior sanitarian		1
Surgeon	39	90
Dental surgeon	1	1
Engineer	12	23
Sanitarian		8
Passed assistant surgeon	107	273
Passed assistant dental surgeon	9	75
Passed assistant engineer	20	51
Passed assistant sanitarian		12
Assistant surgeon	257	348
Assistant dental surgeon	59	141
Assistant engineer	27	89
Assistant sanitarian		54
Total	555	1,194

ACTING ASSISTANT SURGEONS (CIVIL SERVICE)

In marine hospitals	119	98
Immigration, relief and maritime, border, insular, and foreign quarantine work	543	474
Field investigations of Public Health	7	6
Coast Guard and Lighthouse Services	204	267
Penal and correctional institutions	67	47
Venereal disease activities	31	20
Employees' Compensation Commission	3	3
States relations activities	27	6
Total	1,001	921

CONTRACT DENTAL SURGEONS

In marine hospitals	4	4
Second- and third-class relief stations	37	56
Penal and correctional institutions		1
Coast Guard	7	26
Total	48	87

Table 2.—*Numbers of commissioned officers (regular corps), active reserve officers, and other medical, dental, sanitary engineer, and allied personnel, on duty July 1, 1942, and July 1, 1943*—Continued

ATTENDING SPECIALISTS

Grade	July 1, 1942	July 1, 1943
In marine hospitals	342	350
Second- and third-class relief stations	50	67
States relations activities	80	132
Field investigations of public health	228	102
Venereal disease activities	114	87
Penal and correctional institutions	176	138
Total	990	876

MEDICAL AND DENTAL INTERNES

Medical and dental internes	140	173

PHARMACISTS AND ADMINISTRATIVE ASSISTANTS (CIVIL SERVICE)

Pharmacist	20	34
Administrative assistant	96	135
Total	116	169

Table 3.—*Changes in the regular commissioned corps during the fiscal year 1943*

	Promoted to higher grade	New appointments	Retired	Deaths	Resignations	Separations
Medical director			4	2		
Dental director						
Sanitary engineer director			1	1		
Senior surgeon	17					
Senior dental surgeon	1					
Senior sanitary engineer	6					
Surgeon	39			2		
Dental surgeon	5					
Sanitary engineer	2					
Pharmacist						
Passed assistant surgeon	104			1	1	
Passed assistant dental surgeon	6					
Passed assistant sanitary engineer	6	3				
Passed assistant pharmacist	3		1			
Assistant surgeon	57	66		2		1
Assistant dental surgeon	5	10				
Assistant sanitary engineer	2	7			1	
Total	*253	86	6	8	2	1

*NOTE.—226 of these are temporary promotions authorized by Public Law No. 11, approved Mar. 18, 1943

Appendix C

Appendix C contains tabular statements of activities of certain Divisions of the Public Health Service and St. Elizabeths Hospital for the fiscal years 1942 and 1943.

Table 1.—*Federal aid to nursing education programs, fiscal years 1942 and 1943*

Type of program	Number of programs		Increased number of student admissions over 1940–41		Amount of Federal funds allotted [1]	
	1942	1943	1942	1943	1942	1943
Basic	246	380	6,242	7,532	$1,301,729.00	$2,568,614.70
Refresher	73	28	2,300	8,816	73,118.76	32,321.39
Postgraduate:						
Administrative and educational	50	25	1,237	1,094	202,296.99	279,424.92
Public health nursing	44	30	813	1,066	164,861.75	251,136.66
Clinical	11	6	122	89	40,559.50	22,914.25
Anesthesia	3	4	17	20	3,834.00	9,591.82
Midwifery	3	2	17	16	13,600.00	11,620.00
3,770 students admitted to basic courses after June 1942						324,376.26
Total	430	475	10,748	10,633	1,800,000.00	3,500,000.00

[1] Preliminary report for 1943 represents amount paid to schools to date and estimated amount to be used for final payment.

Table 2.—*Number of nurses actively engaged in nursing work in the continental United States (exclusive of Territories and possessions), April 1943, as revealed by replies to individual questionnaires*

Type of present position	Total	Distribution of nurses by marital status and age					
		Single (including widowed, divorced, and unknown marital status)			Married		
		Under 40	40 to 44	45 and over and unknown age	Under 40	40 to 44	45 and over and unknown age
Grand total	170,599	62,434	10,294	30,238	46,793	8,013	12,827
Institutional:							
General staff	47,326	21,213	1,902	4,976	14,070	2,004	3,161
Administration of hospital	2,654	564	331	1,098	326	117	218
Administration of nursing service	2.421	690	305	849	326	95	156
Administration of nursing school	1,307	442	167	444	148	36	70
Supervision, head nursing	21,386	10,069	1,488	3,519	4,662	666	982
Formal teaching	2,610	1,290	218	432	459	83	128
Total	77,704	34,268	4,411	11,318	19,991	3,001	4,715
Public health:							
General staff	14,338	5,069	1,005	3,171	3,119	745	1,229
Administration	1,319	269	139	559	169	55	128
Supervision	2,562	650	314	927	329	100	242
Formal teaching	681	157	45	172	160	46	101
Total	18,900	6,145	1,503	4,829	3,777	946	1,700
Other:							
Industrial	11,220	4,142	644	1,546	3,601	554	733
Private duty	44,299	12,149	2,657	8,827	14,130	2,537	3,999
Other (including unknown)	18,476	5,730	1,079	3,718	5,294	975	1,680
Total	73,995	22,021	4,380	14,091	23,025	4,066	6,412

Table 3.—*Total number of public health nurses employed in the United States, in the Territories of Hawaii and Alaska, and in Puerto Rico [1] on Jan. 1, 1939, 1940, 1941, 1942, 1943, as reported to State health departments by the employing agencies*

	1939	1940	1941	1942	1943
Grand total [2]	20,188	20,434	20,441	21,123	20,772
State agencies	814	840	859	864	886
Local official health agencies:					
Rural	3,918	4,399	4,377	4,971	5,127
Urban	5,262	5,301	5,259	5,640	5,604
Local boards of education	4,120	3,952	4,010	3,913	3,786
Local nonofficial agencies	5,947	5,820	5,803	5,590	5,156
National agencies and universities	127	122	133	145	213
Number of counties having no rural public health nursing service	780	857	679	782	826
Number of cities having no public health nursing of any type	14	20	31	32	28

[1] Puerto Rico included in 1942 and 1943 count only.
[2] Exclusive of industrial nurses.

Table 4.—*Payments to States under the provisions of title VI of the Social Security Act during the fiscal years 1942 and 1943*

State	Total payment		State	Total payment	
	1942	1943		1942	1943
Alabama	$370,900.00	$359,752.00	Montana	$73,123.46	$49,218.00
Alaska	43,400.00	35,113.00	Nebraska	110,100.00	84,579.00
Arizona	76,800.00	71,895.00	Nevada	40,500.00	37,406.00
Arkansas	268,200.00	195,121.00	New Hampshire	55,500.00	52,269.00
California	419,000.00	390,984.47	New Jersey	242,000.00	227,640.00
Colorado	116,700.00	115,938.78	New Mexico	93,900.00	89,070.12
Connecticut	120,100.00	107,902.74	New York	697,881.50	661,374.00
Delaware	34,700.00	33,112.00	North Carolina	413,100.00	375,435.02
District of Columbia	72,200.00	68,265.44	North Dakota	82,900.00	74,684.28
Florida	195,700.00	181,994.80	Ohio	431,700.00	350,699.29
Georgia	359,500.00	362,423.21	Oklahoma	246,400.00	221,754.28
Hawaii	71,500.00	51,131.00	Oregon	103,500.00	112,856.00
Idaho	89,000.00	77,766.71	Pennsylvania	622,100.00	537,891.00
Illinois	492,900.00	492,377.61	Puerto Rico	282,400.00	213,598.00
Indiana	261,600.00	249,825.00	Rhode Island	71,000.00	62,996.62
Iowa	216,900.00	198,434.00	South Carolina	259,600.00	253,686.94
Kansas	162,700.00	174,299.00	South Dakota	78,701.00	70,465.00
Kentucky	327,000.00	341,368.00	Tennessee	342,300.00	288,109.00
Louisiana	242,300.00	272,362.00	Texas	594,300.00	621,520.00
Maine	81,875.01	70,052.03	Utah	72,800.00	63,932.00
Maryland	149,200.00	132,300.71	Vermont	56,100.00	33,358.46
Massachusetts	268,500.00	225,255.48	Virginia	279,000.00	271,139.00
Michigan	344,300.00	314,571.00	Washington	139,100.00	135,810.97
Minnesota	214,500.00	208,293.23	West Virginia	179,400.00	129,564.00
Mississippi	328,600.00	339,287.68	Wisconsin	207,400.00	188,590.00
Missouri	329,000.00	256,454.00	Wyoming	41,113.82	38,745.00

Total payments to States:
1942 $11,472,994.79
1943 10,572,671.87

Table 5.—*Funds budgeted from all sources for cooperative health work, by purpose, and proportion of contribution from title VI funds for the years 1942 and 1943*

Purpose	1942				1943			
	Amount budgeted from all sources	Percent of funds budgeted for each purpose		Ratio of title VI funds to amount budgeted from all sources	Amount budgeted from all sources	Percent of funds budgeted for each purpose		Ratio of title VI funds to amount budgeted from all sources
		All sources	Title VI			All sources	Title VI	
Training	$1,680,474.88	1.41	6.05	47.19	$1,317,559.65	1.01	3.72	33.35
Administrative, clerical, and fiscal	2,607,068.42	2.19	5.67	28.17	2,957,541.95	2.35	5.82	23.23
Capital investment	253,833.85	.21	-------	-------	14,237.50	.01	-------	-------
Personnel administration	207,948.84	.17	.57	35.25	277,729.56	.22	.88	37.57
State-wide health services:								
Preventable disease control:								
General	1,284,064.78	1.08	1.99	20.03	1,317,640.75	1.04	2.19	19.60
Venereal diseases	1,009,523.75	.85	.17	2.17	1,242,727.56	.98	.06	.54
Tuberculosis (excludes sanatoria)	1,290,399.42	1.09	2.73	27.38	1,076,668.33	.85	2.43	26.57
Malaria	332,028.16	.28	1.03	40.23	271,593.63	.21	.64	27.83
Pneumonia	275,561.16	.23	.71	33.51	162,802.91	.13	.27	19.77
Trachoma	93,802.45	.08	.27	37.66	101,136.50	.08	.24	27.80
Laboratory	6,511,394.31	5.49	6.93	13.79	6,978,466.90	5.55	6.31	10.67
Aid to crippled children	3,749,046.23	3.15	-------	-------	3,951,389.48	3.14	.01	.03
Vital and other statistical studies	3,039,290.45	2.56	5.08	21.63	3,947,073.32	3.13	4.09	12.23
Environmental sanitation	3,715,449.21	3.13	9.20	32.07	3,738,378.20	2.96	9.48	29.89
Maternal and child health	2,722,966.30	2.30	.09	.43	3,468,234.09	2.75	-------	-------
Public health nursing	1,394,523.71	1.17	1.51	14.04	1,656,000.36	1.31	1.78	12.66
Supervision of local health services	1,545,909.38	1.30	5.34	44.71	1,543,681.35	1.22	5.09	38.88
Public health education	1,198,809.16	1.01	2.67	28.78	1,233,210.87	.97	2.35	22.47
Cancer control	1,204,013.12	1.01	.99	10.63	1,204,832.86	.95	.53	5.13
Dental hygiene	849,505.09	.71	.92	14.05	1,027,012.75	.81	.93	10.66
Food and drugs	830,070.76	.70	.87	31.56	907,069.97	.71	.93	12.10
Industrial hygiene	711,321.28	.60	4.27	77.67	710,521.80	.56	4.44	73.68
Mental hygiene	106,479.40	.09	.20	7.11	349,329.99	.27	.20	6.44
Nutrition	212,649.87	.18	.15	8.91	286,411.36	.22	.11	4.60
Medical care	355,946.71	.30	.14	5.13	271,167.00	.21	.17	7.28
Surveys and studies	168,528.61	.14	.23	17.71	168,468.50	.13	.11	7.95
School medical inspection	104,047.50	.09	.09	11.59	119,692.50	.10	.12	11.86
Boards of examiners and registration	46,516.00	.04	-------	1.35	52,762.96	.41	.02	5.28
Public welfare	531,069.12	.45	.02	.57	391,337.50	.30	.03	.84
Institutional care [1]	6,640,892.72	5.59	-------	-------	6,064,512.81	4.83	-------	-------
Tuberculosis sanatoria	14,974,177.51	12.59	.17	.15	16,620,430.67	13.26	.17	.12
Local health services	59,196,103.51	49.81	41.94	9.17	61,779,650.55	49.33	46.88	8.95
Total	118,843,415.21	100.00	100.00	10.90	125,209,274.13	100.00	100.00	9.41

[1] Excludes institutional care identified with any of the above programs.

Table 6.—*Statement of quarantine services rendered at maritime quarantine stations during the fiscal year 1942*

Station	Inspection services	Detention services	Special services	Fumigation services	Total charges
Aberdeen, Wash	0	0	0	$5.00	$5.00
Anacortes, Wash	0	0	0	0	0
Astoria, Oreg	$100	0	0	0	100.00
Baltimore, Md	6,180	0	$3.948.25	2,712.95	12,841.20
Bellingham, Wash	0	0	0	0	0
Boca Grande, Fla	60	0	0	0	60.00
Boston, Mass.[1]	5,180	0	930.00	2,445.96	8,555.96
Brunswick, Ga	0	0	0	0	0
Carrabelle (St. George's Sound), Fla	75	0	0	0	75.00
Charleston, S. C	1,460	0	170.00	287.18	1,917.18
Corpus Christi, Tex.[2]	330	0	0	0	330.00
Eastport, Maine	25	0	0	0	25.00
Everett, Wash	0	0	0	0	0
Eureka, Calif	0	0	0	0	0
Fall River, Mass	105	0	10.00	0	115.00
Fernandina (Cumberland Sound), Fla	70	0	0	0	70.00
Fort Lauderdale (Port Everglades), Fla	425	0	125.00	0	550.00
Fort Monroe, Va	4,642	0	1,430.00	1,266.63	7,338.63
Fort Pierce, Fla	0	0	0	0	0
Freeport, Tex	20	0	0	0	20.00
Galveston, Tex	4,005	0	950.00	466.50	5,421.50
Georgetown, S. C	0	0	0	0	0
Gloucester, Mass	0	0	0	0	0
Gulfport, Miss	60	0	0	0	60.00
Jacksonville (St. Johns River), Fla	1,175	0	200.00	73.61	1,448.61
Key West, Fla	290	0	30.00	0	320.00
Los Angeles, Calif	4,670	0	1,330.00	1,797.70	7,797.70
Marshfield (Coos Bay), Oreg	0	0	0	0	0
Miami, Fla	220	0	110.00	37.44	367.44
Mobile, Ala	4,070	0	1,210.00	610.03	5,890.03
Morehead City, N. C	30	0	0	0	30.00
New Bedford, Mass	70	0	0	0	70.00
New London, Conn	10	0	0	0	10.00
New Orleans, La	7,842	0	2,116.25	1,840.74	11,798.99
Newport, R. I	0	0	0	0	0
New York, N. Y	36,121	0	9,679.25	11,356.47	57,156.72
Ogdensburg, N. Y	0	0	0	0	0
Olympia, Wash	0	0	0	0	0
Panama City (St. Andrews Bay), Fla	50	0	0	0	50.00
Pensacola, Fla	425	0	55.00	12.59	492.59
Perth Amboy, N. J	520	0	0	0	520.00
Philadelphia (Marcus Hook), Pa	7,795	0	2,024.25	3,025.31	12,844.56
Port Angeles, Wash	943	0	0	0	943.00
Port Aransas, Tex	275	0	0	0	275.00
Port Isabel (Brownsville), Tex	0	0	0	0	0
Portland, Maine	1,440	0	320.00	0	1,760.00
Portland, Oreg	245	0	210.00	753.13	1,208.13
Port St. Joe, Fla	0	0	0	0	0
Providence, R. I	695	0	10.00	112.14	817.14
Sabine, Tex	970	0	260.00	0	1,230.00
San Diego (Point Loma), Calif	1,090	0	950.00	0	2,040.00
San Francisco (Angel Island), Calif	4,016	0	1,330.00	1,095.47	6,441.47
San Luis Obispo (Port San Luis), Calif	190	0	20.00	0	210.00
Savannah, Ga	862	0	120.00	0	982.00
Searsport, Maine	10	0	0	0	10.00
Seattle, Wash	0	0	520.00	2,068.74	2,588.74
South Bend, Wash	0	0	0	0	0
Tampa, Fla	1,643	0	350.00	236.90	2,229.90
Vineyard Haven, Mass	0	0	0	0	0
West Palm Beach, Fla	0	0	0	0	0
Wilmington, N. C	50	0	30.00	0	80.00
Total	98,454	0	28,438.00	30,204.49	157,096.49
Alaska:					
Ketchikan	0	0	0	0	0
Wrangell	0	0	0	0	0
Hawaii:					
Ahukini	0	0	0	0	0
Hilo	25	0	0	0	25.00
Honolulu	1,946	0	70.00	6.85	2,022.85
Kahului	0	0	0	0	0
Lahaina	0	0	0	0	0
Makukona	0	0	0	0	0
Port Allen	0	0	0	0	0
Total	1,971	0	70.00	6.85	2,047.85

Table 6.—*Statement of quarantine services rendered at maritime quarantine stations during the fiscal year 1942*—Continued

Station	Inspection services	Detention services	Special services	Fumigation services	Total charges
Puerto Rico:					
Aguadilla	$35	0	0	0	$35.00
Arecibo	0	0	0	0	0
Arroyo	35	0	0	0	35.00
Central Aguirre	100	0	$10.00	0	110.00
Fajardo	55	0	10.00	0	65.00
Guanica	125	0	0	0	125.00
Humacao	55	0	0	0	55.00
Mayaguez	285	0	20.00	0	305.00
Ponce	330	0	0	0	330.00
San Juan	2,760	0	190.00	$457.48	3,407.48
Total	3,780	0	230.00	457.48	4,467.48
Virgin Islands:					
Charlotte Amalie	6,787	0	240.00	40.11	7,067.11
Christiansted	100	0	0	0	100.00
Frederiksted	90	0	0	0	90.00
Total	6,977	0	240.00	40.11	7,257.11
Total, all stations	111,182	0	28,978.00	30,708.93	170,868.93

[1] Includes Plymouth, Mass.
[2] Includes Ingleside and Harbor Island, Tex.

Table 7.—*Statement of quarantine services rendered at maritime quarantine stations during the fiscal year 1943*

Station	Inspection services	Detention services	Special services	Fumigation services	Total charges
Aberdeen, Wash	0	0	0	0	0
Anacortes, Wash	0	0	0	0	0
Astoria, Oreg	$1,013	0	0	0	$1,013.00
Baltimore, Md	1,876	0	$1,380	$2,093.30	5,349.30
Bellingham, Wash	0	0	0	0	0
Boca Grande, Fla	0	0	0	0	0
Boston, Mass.[1]	1,607	0	360	91.72	2,058.72
Brunswick, Ga	0	0	0	0	0
Carrabelle (St. George's Sound), Fla	0	0	0	0	0
Charleston, S. C	455	0	20	84.26	559.26
Corpus Christi, Tex	365	0	0	0	365.00
Eastport, Maine	0	0	0	0	0
Everett, Wash	0	0	0	0	0
Eureka, Calif	0	0	0	0	0
Fall River, Mass	0	0	0	0	0
Fernandina (Cumberland Sound), Fla	40	0	0	0	40.00
Fort Lauderdale (Port Everglades), Fla	370	0	260	0	630.00
Fort Monroe, Va	1,525	0	330	1,140.60	2,995.60
Fort Pierce, Fla	0	0	0	0	0
Freeport, Tex	0	0	0	0	0
Galveston, Tex	880	0	440	118.32	1,438.32
Gloucester, Mass	0	0	0	0	0
Gulfport, Miss	0	0	0	0	0
Jacksonville, Fla	375	0	130	137.78	642.78
Key West, Fla	40	0	0	0	40.00
Los Angeles, Calif	4,379	0	3,470	320.13	8,169.13
Marshfield, Oreg	0	0	0	0	0
Miami, Fla	405	0	710	100.70	1,215.70
Mobile, Ala	2,320	0	1,430	280.23	4,030.23
Morehead City, N. C	0	0	0	0	0
New Bedford, Mass	0	0	0	0	0
New London, Conn	0	0	0	0	0
New Orleans, La	3,201	0	1,430	951.58	5,582.58
Newport, R. I	10	0	0	0	10.00
New York, N. Y	28,551	0	5,606	11,368.21	45,525.21
Ogdensburg, N. Y	0	0	0	0	0
Olympia, Wash	0	0	0	0	0
Panama City (St. Andrews Bay), Fla	20	0	0	0	20.00
Pensacola, Fla	240	0	0	122.74	362.74

[1] Includes Plymouth, Mass.

Table 7.—*Statement of quarantine services rendered at maritime quarantine stations during th fiscal year 1943*—Continued

Station	Inspection services	Detention services	Special services	Fumigation services	Total charges
Perth Amboy, N. J.	$65	0	0	0	$65.00
Philadelphia (Marcus Hook), Pa.	2,020	0	$470	$2,168.59	4,658.59
Port Angeles, Wash.	1,355	0	0	0	1,355.00
Port Aransas, Tex.	90	0	0	0	90.00
Port Isabel (Brownsville), Tex.	0	0	0	0	0
Portland, Maine	445	0	210	101.88	756.88
Portland, Oreg.	20	0	620	817.33	1,457.33
Port St. Joe, Fla.	0	0	0	0	0
Providence, R. I.	50	0	0	0	50.00
Sabine, Tex.	270	0	370	0	640.00
San Diego (Point Loma), Calif.	535	0	330	0	865.00
San Francisco, Calif.	2,935	0	2,990	1,209.36	7,134.36
San Luis Obispo (Port San Luis), Calif.	60	0	20	0	80.00
Savannah, Ga.	60	0	40	408.00	508.00
Searsport, Maine	0	0	0	0	0
Seattle, Wash.	10	0	710	873.01	1,593.01
South Bend, Wash.	0	0	0	0	0
Tacoma, Wash.	0	0	0	0	0
Tampa, Fla.	1,995	0	610	334.16	2,939.16
Vineyard Haven, Mass.	0	0	0	0	0
West Palm Beach, Fla.	125	0	0	32.16	157.16
Wilmington, N. C.	10	0	450	0	460.00
Total	57,717	0	22,386	22,754.06	102,857.06
Alaska:					
Ketchikan	0	0	0	0	0
Wrangell	0	0	0	0	0
Hawaii:					
Ahukini	0	0	0	0	0
Hilo	10	0	0	0	10.00
Honolulu	110	0	30	106.66	246.66
Kahului	0	0	0	0	0
Lahaina	0	0	0	0	0
Makukona	0	0	0	0	0
Port Allen	0	0	0	0	0
Total	120	0	30	106.66	256.66
Puerto Rico:					
Aguadilla	70	0	0	0	70.00
Arecibo	0	0	0	0	0
Arroyo	5	0	0	0	5.00
Central Aguirre	5	0	0	0	5.00
Fajardo	25	0	10	0	35.00
Guanica	40	0	0	0	40.00
Humacao	40	0	0	0	40.00
Mayaguez	1,135	0	0	0	1,135.00
Ponce	245	0	0	0	245.00
San Juan	1,535	0	70	117.39	1,722.39
Total	3,100	0	80	117.39	3,297.39
Virgin Islands:					
Charlotte Amalie	1,420	0	0	0	1,420.00
Christiansted	45	0	0	0	45.00
Frederiksted	10	0	0	0	10.00
Total	1,475	0	0	0	1,475.00
Total, all stations	62,412	0	22,496	22,978.11	107,886.11

Table 8.—*Applicants for immigration visas medically examined and certified during the fiscal year 1942*

Country and consular office	Number of applicants examined	Number of applicants in each class			Number of applicants certified		
		Quota	Non-quota	Non-immigrants	Class A	Class B	Total
WESTERN HEMISPHERE							
Cuba: Havana	1,618	872	746	0	11	337	348
Canada, total	15,241	3,957	9,885	1,399	53	2,633	2,686
Montreal	5,068	2,109	2,922	37	25	998	1,023
Niagara Falls	861	173	688	0	4	120	124
Quebec	260	0	260	0	1	49	50
Toronto	2,125	637	1,482	6	6	338	344
Vancouver	1,559	438	1,101	0	2	95	97
Windsor	3,230	524	2,702	4	13	843	856
Winnipeg	2,021	56	613	1,352	2	162	164
Yarmouth	117	0	117	0	0	28	28
All countries, Western Hemisphere	16,859	4,829	10,631	1,399	64	2,970	3,034
EASTERN HEMISPHERE							
Europe, total	792	708	80	4	7	247	254
England: London	663	589	74	0	3	185	188
Germany, total	106	101	5	0	3	52	55
Berlin [1]	3	3	0	0	0	0	0
Stuttgart [1]	103	98	5	0	3	52	55
Ireland, Northern: Belfast	5	2	0	3	1	1	2
Irish Free State: Dublin	18	16	1	1	0	9	9
Scotland: Glasgow	0	0	0	0	0	0	0
Philippine Islands: Manila [2]	24	6	17	1	0	5	5
All countries, Eastern Hemisphere	816	714	97	5	7	252	259

[1] 1 month. [2] 4 months, July to October 1943.

Table 9.—*Applicants for immigration visas medically examined and certified during fiscal year 1943*

Country and consular office	Number of applicants examined	Number of applicants in each class			Number of applicants certified		
		Quota	Non-quota	Non-immigrants	Class A	Class B	Total
WESTERN HEMISPHERE							
Cuba, Havana	1,549	969	580	0	5	380	385
Canada, total	13,490	4,942	7,138	1,410	58	2,814	2,872
Montreal	5,007	2,875	2,122	10	13	1,187	1,200
Niagara Falls	842	296	532	14	20	155	175
Quebec	185	0	185	0	0	37	37
Toronto	1,890	666	1,216	8	2	384	386
Vancouver	1,385	411	974	0	0	136	136
Windsor	2,304	620	1,664	20	22	720	742
Winnipeg	1,873	74	441	1,358	1	195	196
Yarmouth [1]	4	0	4	0	0	0	0
Total—Western Hemisphere	15,039	5,911	7,718	1,410	63	3,194	3,257
EASTERN HEMISPHERE							
Europe, total	1,206	1,100	106	0	5	539	544
England: London	1,137	1,052	85	0	5	520	525
Scotland: Glasgow	0	0	0	0	0	0	0
Ireland, Northern: Belfast [2]	21	16	5	0	0	8	8
Irish Free State: Dublin [2]	48	32	16	0	0	11	11
Western and Eastern Hemispheres	16,245	7,011	7,824	1,410	68	3,733	3,801

[1] Consulate closed Sept. 1, 1943. [2] 5-month period.

Table 10.—*Number of cases of certain communicable diseases and cases per 100,000 population in the United States during 1940, 1941, and 1942* [1]

Disease	Number of States [2]	Aggregate population (in thousands)			Cases			Cases per 100,000 population		
		1940 [3]	1941 [3]	1942	1940	1941	1942	1940	1941	1942
Chickenpox	48	131,191	130,661	130,131	280,300	299,580	303,167	213.7	229.3	233.0
Diphtheria	48	131,191	130,661	130,131	15,536	17,987	16,243	11.8	13.8	12.5
Influenza [4]	48	131,191	130,661	130,131	431,472	685,300	161,497	328.9	524.5	124.1
Malaria [4]	48	131,191	130,661	130,131	78,130	68,075	60,137	60.0	52.1	46.2
Measles	48	131,191	130,661	130,131	291,162	894,134	547,513	221.9	684.3	420.7
Meningitis, meningococcus [4]	48	131,191	130,661	130,131	1,665	2,032	3,818	1.3	1.6	2.9
Mumps	45	111,441	111,091	110,744	118,369	199,601	287,136	106.2	179.7	259.3
Pellagra [4]	48	131,191	130,661	130,131	9,245	8,425	6,793	7.0	6.4	5.2
Pneumonia (all forms) [4]	48	131,191	130,661	130,131	157,512	158,323	152,316	120.1	121.2	117.0
Poliomyelitis	48	131,191	130,661	130,131	9,826	9,086	4,028	7.5	7.0	3.1
Scarlet fever	48	131,191	130,661	130,131	155,464	128,928	128,182	118.5	98.7	98.5
Smallpox	48	131,191	130,661	130,131	2,795	1,396	864	2.1	1.1	.7
Tuberculosis (all forms) [4]	48	131,191	130,661	130,131	106,168	109,320	119,844	80.9	83.7	92.1
Tuberculosis (respiratory system) [4]	42	119,765	119,326	118,889	75,248	78,164	87,541	62.8	65.5	73.6
Typhoid and paratyphoid fever	48	131,191	130,661	130,131	9,809	8,601	6,678	7.5	6.6	5.1
Whooping cough	48	131,191	130,661	130,131	183,866	222,202	191,339	140.2	170.1	147.0

[1] Figures for cases and population estimates are totals (civilian and military) for the United States.
[2] In addition to the number of States given, the District of Columbia is also included.
[3] Later population estimates used than those used in the 1942 annual report.
[4] Includes the numbers of deaths used as cases in those States which report no cases, or in which States the number of reported cases is less than the number of deaths.

Table 11.—*World prevalence of cholera, plague, smallpox, typhus fever, and yellow fever, 1941 and 1942*

CHOLERA

Country	1941		1942	
	Cases	Deaths	Cases	Deaths
Afghanistan	Present			
Ceylon	3	2	103	54
China	[1] 4,440	[1] 1,726	[1] 1,673	[1] 444
India	[2] 97,925	[2] 59,855	172,308	92,804
India (French)	38	15	14	10
Japan	2			

PLAGUE

Argentina	125	12	28	18
Basutoland			10	4
Belgian Congo	40	39	4	4
Brazil	155	24	9	1
British East Africa	1,280	771	1,146	694
Chile	2	1	1	
China	135	94	[2] 6	[2] 109
Dutch East Indies	1,047	601		
Ecuador	37		4	2
Egypt	10	5	14	5
India	[2] 4,212	[2] 4,037	1,286	677
Indochina (French)	26	19	81	38
Madagascar	285	39	181	163
Morocco	2,210		362	
New Caledonia	11	8	2	1
Palestine	10		12	2
Peru	67	33	98	43
Portugal (Azores Islands)	6	6	56	
Rhodesia (Northern)			16	2
Senegal			6	6
Thailand	4	3		
Tunisia	2			
Union of South Africa	74	44	114	35

[1] For a few cities only.
[2] Very incomplete.

Table 11.—*World prevalence of cholera, plague, smallpox, typhus fever, and yellow fever, 1941 and 1942*—Continued

SMALLPOX

Country	1941		1942	
	Cases	Deaths	Cases	Deaths
Algeria	935		814	
Angola	192	12	268	
Argentina			169	33
Basutoland			130	5
Belgian Congo	682	25	1,132	22
Bolivia	324			
Brazil	2		3	1
British East Africa	79	2	84	4
Canada	25		5	
Ceylon	114	16	7	
China	259	59	9	1
Chosen	696	173		
Colombia	1,255	29	615	8
Dahomey	467		56	3
Dutch East Indies	3			
Dominican Republic	2			
Ecuador			6	1
France	1		57	
French Equatorial Africa			2	
French Guinea	45		138	9
French West Africa	3			
Gold Coast	1,344	184	1,423	81
Great Britain			105	25
Guatemala	6		7	
India	[2] 40,692	[2] 12,526	30,228	6,104
India (French)	9	4		
India (Portuguese)	70	2		
Indochina (French)	1,298	162	3,729	299
Iran	8		194	95
Iraq	1,593	141	344	37
Ireland (Northern)			1	
Irish Free State			12	
Ivory Coast	40	1	71	1
Japan	200			
Mexico	321	25	134	39
Morocco	648		1,558	
Nigeria	1,026	176	2,533	501
Niger Territory	273		986	11
Palestine			10	
Panama Canal Zone	11			
Paraguay	8			
Peru	1,841		1,152	5
Portugal	53		56	
Portuguese East Africa	9		51	23
Portuguese Guinea	20			
Rhodesia	86		10	
Senegal	65		17	
Sierra Leone	15	1	1	
Spain	457	19	211	
Straits Settlements	1			
Sudan (Anglo-Egyptian)	7			
Sudan (French)	19		296	
Switzerland	1			
Syria and Lebanon	1		1,983	
Thailand	546	59		
Trans-Jordan			4	
Tunisia	1		1	
Turkey			1,841	
Union of South Africa	888		1,462	30
Uruguay	7			
Venezuela	254	6	159	5
Zanzibar			2	

TYPHUS FEVER

Afghanistan			2,439	487
Algeria	12,827		35,205	
Argentina			1	
Australia	15		42	
Basutoland	69	30	36	10
Bolivia	493			
Brazil	1			
British East Africa	12		23	1
Bulgaria	289		709	

[2] Very incomplete.

Table 11.—*World prevalence of cholera, plague, smallpox, typhus fever, and yellow fever, 1941 and 1942*—Continued

TYPHUS FEVER—Continued

Country	1941		1942	
	Cases	Deaths	Cases	Deaths
Chile	337	25	128	10
China	215		369	57
Chosen	425	15		
Colombia	11		89	4
Czechoslovakia	28		28	
Dutch East Indies	136			
Ecuador	127	19	171	20
Egypt	17,956	2,306	32,288	3,200
France	135		230	
Germany	2,158	129	2,043	
Gibraltar	2			
Great Britain			1	
Greece	7			
Guatemala	191	52	251	83
Hawaii Territory	60			
Hungary	652		827	
India	4	3	10	4
Indochina			11	
Iran	115		907	101
Iraq	53		105	
Irish Free State	26		29	
Ivory Coast			4	
Jamaica			53	
Japan	864	157		
Malay (Unfederated States)	1	1		
Mexico	222	60	978	[2] 158
Morocco	1,471		25,846	
Nigeria			5	
Niger Territory			1	
Palestine	284		206	
Panama Canal Zone	5			
Peru	1,435		923	
Poland	3,786			
Portugal	50		1	
Puerto Rico	12			
Rhodesia			1	
Rumania	1,827		3,992	
Salvador	19		1	
Senegal			3	
Sierra Leone	7		7	
Spain	9,560	535	4,145	[2] 192
Straits Settlements	8			
Switzerland	5		4	
Syria and Lebanon			27	
Trans-Jordan	9		8	
Tunisia	7,078		16,295	
Turkey	704		427	
Union of South Africa	787	176	1,952	399
Union of Soviet Socialist Republics			67	
Venezuela	59		27	2
Yugoslavia	86			

YELLOW FEVER

Belgian Congo	5	1		2
Bolivia			94	[2] 15
Brazil		16		6
British East Africa	1		1	1
Colombia		47		18
Dahomey	2			
French Equatorial Africa	6			
French Guinea	3			
French West Africa	5		1	1
Gold Coast	4		3	1
Ivory Coast	8		7	4
Nigeria	1		2	1
Peru	5			
Senegal		15		16
Sierra Leone			2	2
Spanish Guinea		4		
Sudan (French)	11			1
Togo			1	1
Venezuela	1		2	2

[2] Very incomplete.

Table 12.—*Medical services for various classes of beneficiaries, fiscal year 1942*

Beneficiary	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1942	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
American merchant seamen	148,084	28,845	639	2,244	914,071	119,239	445,922	37,003
Coast Guard personnel	238,818	16,167	53	978	240,222	222,651	529,305	93,308
Coast Guard dependents	14,323	1,157	8	36	8,845	13,166	54,627	346
Coast and Geodetic Survey personnel	1,306	155	2	9	3,916	1,151	4,462	297
Coast and Geodetic Survey dependents	673	59	------	3	434	614	2,884	13
Seamen, Engineer Corps and Army Transport Service	8,823	1,897	27	149	48,835	6,926	21,005	1,256
Seamen, not enlisted or commissioned, from other Government vessels	151	60	3	9	1,166	91	338	344
Seamen from foreign vessels	4,446	2,207	18	163	50,053	2,239	6,107	15
Public Health Service officers and employees	21,469	1,888	23	49	23,424	19,581	84,423	3,453
Persons afflicted with leprosy	449	449	26	387	136,973	----------	----------	-------
Employees, Compensation Commission	46,458	7,170	36	440	115,973	39,288	170,339	37,819
Immigrants and alien seamen	10,830	3,226	13	222	72,109	7,604	22,127	986
Army and Selective Service	3,445	929	7	50	9,633	2,516	4,668	628
Navy and Marine Corps	2,992	1,861	11	106	22,046	1,131	2,747	77
Veterans' Administration	9,885	9,712	714	784	294,529	173	1,458	2,398
Civilian Conservation Corps	2,137	1,974	17	40	45,708	163	363	40
Work Projects Administration	25,633	5,908	17	224	125,173	19,725	103,765	26,270
National Youth Administration	3,281	431	2	16	7,381	2,850	8,826	1,340
Former enrollees, Civilian Conservation Corps	350	310	------	18	6,892	40	122	79
Maritime Service	64,373	2,026	4	51	14,086	62,347	150,250	20,088
Miscellaneous	145,068	555	33	19	7,247	144,513	183,822	73,363
Total	752,994	86,986	1,653	5,997	2,148,716	666,008	1,797,560	299,123

Table 13.—*Medical services for various classes of beneficiaries, fiscal year 1943* [1]

Beneficiary	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1943	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
American merchant seamen	130,888	26,196	631	2,102	787,859	104,692	392,242	37,882
Coast Guard personnel	841,517	64,123	84	1,807	728,875	777,394	1,882,036	279,748
Coast Guard dependents	19,319	1,884	17	76	16,031	17,435	70,336	253
Coast and Geodetic Survey personnel	602	99	1	5	3,066	503	1,992	184
Coast and Geodetic Survey dependents	426	36	------	3	240	390	1,830	3
Seamen, Engineer Corps and Army Transport Service	10,738	2,755	45	162	62,158	7,983	26,846	555
Seamen, not enlisted or commissioned, from other Government vessels	272	110	1	10	3,115	162	423	147
Seamen from foreign vessels	4,891	2,096	23	120	45,783	2,795	7,871	17
Public Health Service officers and employees	22,376	2,137	18	83	26,888	20,239	89,413	3,862
Persons afflicted with leprosy	455	449	28	373	138,861	6	30	3
Employees' Compensation Commission	68,696	10,555	60	580	173,443	58,141	257,787	44,958
Immigrants and alien seamen	10,740	2,950	16	178	68,578	7,790	22,304	1,388
Army and Selective Service	6,841	2,451	15	49	24,388	4,390	9,368	160
Navy and Marine Corps	7,413	3,491	12	51	43,672	3,922	7,687	75
Veterans' Administration	9,045	8,906	718	654	256,198	139	1,129	958
Civilian Conservation Corps	92	82	5	1	3,346	10	88	9
Work Projects Administration	8,914	2,338	9	72	52,885	6,576	41,222	8,706
National Youth Administration	2,345	296	------	5	3,643	2,049	5,827	957
Former Enrollees, Civilian Conservation Corps	218	197	1	7	5,509	21	50	37
Maritime Service	4,992	2,008	5	107	31,404	2,984	5,592	3,894
Miscellaneous	150,347	865	31	27	10,100	149,482	200,109	61,354
Total	1,301,127	134,024	1,720	6,472	2,486,042	1,167,103	3,024,182	445,150
Not included above:								
Sheepshead Bay Hospital, Brooklyn, N. Y.:								
Coast Guard personnel	25,841	3,138	4	138	40,853	22,703	42,198	-------
Public Health Service officers and employees	468	59	------	2	353	409	1,197	145
Miscellaneous	----------	----------	------	----------	----------	----------	----------	6
Total	26,309	3,197	4	140	41,206	23,112	43,395	151

Table 14.—*Percent of total services by class of beneficiary in Marine Hospitals, 1942 and 1943*

Class of beneficiary	Hospital days		Out-patient treatments		Physical examinations (not related to treatment)	
	1942	1943	1942	1943	1942	1943
American merchant seamen	42.54	31.69	24.81	12.98	12.37	8.51
Coast Guard personnel	11.18	29.31	29.45	62.24	31.19	62.85
Coast Guard dependents	.41	.64	3.04	2.33	.12	.06
Coast and Geodetic Survey personnel	.18	.13	.24	.06	.10	.05
Coast and Geodetic Survey dependents	.02		.16	.06		
Seamen, Engineer Corps, and Army Transport Service	2.27	2.51	1.17	.88	.42	.13
Seamen, not enlisted or commissioned from other Government vessels	.05	.13	.02	.02	.12	.04
Seamen from foreign vessels	2.33	1.85	.34	.26	.01	
Persons afflicted with leprosy	6.37	5.59				
Employees' Compensation Commission	5.40	6.98	9.48	8.53	12.64	10.09
Immigrants and alien seamen	3.36	2.76	1.23	.73	.33	.31
Army and Selective Service	.45	.98	.26	.30	.21	.03
Navy and Marine Corps	1.03	1.75	.15	.26	.03	.01
Veterans' Administration	13.70	10.30	.08	.04	.80	.21
Civilian Conservation Corps	2.13	.13	.02		.01	
Work Projects Administration	5.83	2.13	5.77	1.36	8.78	1.96
Maritime Service	.66	1.27	8.36	.18	6.72	.87
Mariners for licenses					5.74	3.73
Federal employees for other purposes					13.69	5.46
All others entitled to treatment	2.09	1.85	15.42	9.77	6.72	5.69
Total	100.00	100.00	100.00	100.00	100.00	100.00
Not included above:						
Sheepshead Bay Hospital, Brooklyn, N. Y.:						
Coast Guard personnel		99.14		97.25		
All others entitled to treatment		.86		2.75		100.00
Total		100.00		100.00		100.00

Table 15.—*Funds budgeted and activities reported for venereal disease control in States and Territories for the fiscal years 1940–1943*

	1940	1941		1942		1943 [1]		
	Amount or number	Amount or number	Percent increase 1940–41	Amount or number	Percent increase 1941–42	Amount or number	Percent increase 1942–43	Percent increase 1940–43
I. Funds budgeted for venereal disease control	$10,645,183.20	$13,153,498.76	23.6	$15,432,508.77	17.3	$18,052,980	17.0	69.6
A. Federal	4,656,528.20	6,362,218.76	36.6	8,447,924.25	32.8	10,595,880	25.4	127.5
B. State and local	5,988,655.00	6,791,280.00	13.4	6,984,584.52	2.8	7,457,100	6.8	24.5
II. Venereal disease control activities:								
A. Syphilis:								
1. Cases reported to State health departments	487,464.00	494,813.00	1.5	489,172.00	[2] −1.1	590,604	20.7	21.2
2. Admissions to clinic service	288,778.00	340,615.00	18.0	343,312.00	.8	430,302	25.3	49.0
3. Average monthly patient load in clinics	290,982.00	384,478.00	32.1	400,198.00	4.1	445,702	11.4	53.2
4. Treatments administered in clinics	8,313,796.00	10,661,259.00	28.2	10,682,137.00	.2	12,506,784	17.1	50.4
a. Arsenicals (doses)	3,719,880.00	4,885,736.00	----------	4,928,484.00	----------	5,891,090	19.5	58.4
b. Heavy metals (doses)	4,593,916,00	5,775,523.00	----------	5,753,653.00	----------	6,615,694	15.0	44.0
5. Arsenical drugs (doses) distributed by State health departments	6,895,837.00	8,161,491.00	18.4	8,727,964.00	6.9	10,813,934	23.9	56.8
6. Serologic tests in laboratories	10,216,978.00	16,520,591.00	61.7	20,173,769.00	22.1	30,895,328	53.1	202.4
B. Gonorrhea:								
1. Cases reported to State health departments	180,383.00	198,432.00	10.0	220,432.00	11.1	282,815	28.3	56.8
2. Admissions to clinic service	66,811.00	84,418.00	26.4	104,421.00	23.7	133,784	28.1	100.2
3. Average monthly patient load in clinics	30,392.00	26,487.00	[2] −12.8	25,536.00	[2] −3.6	33,153	29.8	9.1
4. Treatment visits in clinics	851,694.00	712,164.00	[2] −16.4	801,267.00	12.5	764,315	[2] −4.6	[2] −10.3
5. Sulfonamide drugs (tablets) distributed by State health departments	5,179,586.00	7,218,617.00	37.3	13,836,985.00	91.7	23,102,238	67.0	346.0
6. Tests (for detection of gonococcus) in laboratories	1,038,086.00	1,224,227.00	17.9	1,369,663.00	11.9	1,502,928	9.7	44.8
C. General:								
1. Publications distributed by State health departments	3,324,358.00	4,158,008.00	25.1	4,342,633.00	4.4	2,710,299	[2] −37.6	[2] −18.5
2. Clinics treating venereal disease	2,454.00	3,245.00	32.2	3,569.00	10.0	3,704	3.8	50.9

[1] Estimate based on first 6 months of fiscal year.
[2] Percent decrease.

Table 16.—*Budgetary allocation of Federal funds appropriated under the Venereal Disease Control Act for the fiscal year 1942*

[As of July 15, 1942]

State	Total allotted	Total payments	Total budgeted	Purpose for which budgeted							
				Administration	Consultation and technical information	Public education	Case-finding and case-holding	Laboratory	Treatment facilities	Drugs	Training
Total	$7,816,600	$7,644,698.25	$8,447,294.25	$178,271.98	$757,278.20	$153,114.17	$1,090,910.61	$1,526,262.04	$3,535,186.92	$999,022.43	$207,247.98
Alabama	299,500	299,500.00	295,100.00	5,295.00	35,781.33		33,540.00	23,940.87	166,571.80	25,246.00	4,725.00
Alaska	11,100	11,100.00	13,107.09	760.00	1,690.00	50.00		6,800.00	2,007.09	1,800.00	
Arizona	41,250	41,250.00	42,377.50		1,700.00	325.00	3,120.00	8,380.00	14,690.00	12,422.50	1,740.00
Arkansas	208,600	208,600.00	232,625.91	5,400.00	7,190.00	2,125.00	52,118.00	12,172.50	108,352.41	42,765.00	2,503.00
California	297,850	297,850.00	303,813.04		42,708.60	8,326.29	38,334.30	32,797.62	120,081.76	52,852.11	8,712.36
Colorado	53,400	53,400.00	56,491.44	3,920.00	10,252.54	925.00	7,715.00	5,298.57	22,866.84	4,092.94	1,420.55
Connecticut	53,100	53,100.00	60,780.91		8,343.73	282.00	8,425.66	21,917.36	16,532.16	5,280.00	
Delaware	13,700	12,492.00	14,140.69	660.00	1,545.07		3,090.00	1,380.00	6,043.12	1,422.50	
District of Columbia	65,000	65,000.00	71,765.21	3,267.00	5,570.00	300.00	4,278.34	9,353.99	22,072.67	17,382.64	9,540.57
Florida	182,300	182,300.00	183,438.85	5,784.68	5,800.00	7,680.60	12,294.47	17,110.70	93,141.24	34,074.68	7,552.48
Georgia	360,600	360,600.00	367,909.37	4,530.00	19,425.00		19,600.00	72,120.13	183,884.24	68,250.00	
Hawaii	39,600	39,600.00	29,387.39	2,800.02	2,462.36		8,224.65	3,298.36	4,285.27	8,316.73	
Idaho	24,700	24,025.00	25,720.52	1,670.00	620.00	1,150.00	2,889.00	8,850.00	5,716.52	4,255.00	570.00
Illinois	348,500	348,500.00	365,922.00	10,600.00	77,081.00	1,000.00	84,951.00	34,406.00	147,784.00	10,100.00	
Indiana	162,600	162,600.00	214,716.04	5,649.65	12,705.00	7,501.03	16,223.26	40,768.25	109,897.87	20,890.98	1,080.00
Iowa	101,000	101,000.00	117,391.85	6,565.00	10,631.33	7,200.00	17,090.00	34,745.00	23,157.53	13,000.00	5,002.99
Kansas	100,100	100,100.00	110,221.76	5,250.00	8,975.00	4,500.00	6,035.00	36,861.72	29,660.04	15,000.00	3,940.00
Kentucky	266,100	266,100.00	281,746.97	2,196.82	13,987.73	7,003.00	96,349.37	69,053.89	81,632.04	11,524.12	
Louisiana	241,300	241,300.00	284,848.55	4,337.24	9,460.00	1,000.00	37,918.03	24,025.00	196,608.28	10,000.00	1,500.00
Maine	34,900	29,000.00	46,323.39	3,454.00	1,532.40	5,530.00	6,625.00	5,360.99	18,790.00	1,811.00	3,220.00
Maryland	121,200	121,200.00	151,657.87	2,581.20	22,956.09	2,750.00	9,652.84	22,192.81	45,124.93	10,000.00	36,400.00
Massachusetts	136,300	136,100.00	216,635.70		14,256.00	9,550.00	9,838.35	36,870.00	130,466.35		15,655.00
Michigan	189,600	189,600.00	204,562.37	9,790.21	22,800.00	4,395.00	15,570.00	53,004.71	60,672.82	34,329.63	4,000.00
Minnesota	97,800	95,000.00	99,371.84	999.96	15,431.58	6,325.00	9,552.56	47,219.68	15,303.06	3,140.00	1,400.00
Mississippi	292,600	224,364.32	273,195.89	4,500.00	34,132.00	390.00	69,792.50	11,480.00	107,070.49	43,600.00	2,230.90
Missouri	194,700	194,700.00	282,873.70	2,600.97	12,149.95	2,000.00	22,848.06	66,761.83	141,627.84	27,635.05	7,250.00
Montana	20,900	18,409.50	19,835.00	120.00	225.00	500.00	300.00	11,940.00	2,475.00	4,200.00	75.00
Nebraska	58,100	50,042.50	57,446.14	3,387.09	6,474.05	200.00	18,190.00	7,355.00	7,230.00	11,400.00	3,210.00
Nevada	7,500	7,500.00	8,168.70	875.00	525.00	1,050.00		500.00	1,110.00	4,033.70	75.00
New Hampshire	21,700	21,700.00	23,357.30	1,266.67	7,630.73		4,455.42	4,542.18	3,890.00	897.30	675.00
New Jersey	165,900	165,900.00	172,029.84	6,770.15	30,941.54	7,948.76	26,583.72	28,873.93	26,441.74	43,575.00	895.00
New Mexico	40,150	40,150.00	41,110.70	2,940.00	2,375.00	700.00	3,722.50	3,950.00	18,609.70	8,813.50	
New York	460,700	390,169.50	445,774.93		41,366.66	2,790.00	80,102.00	188,211.27	83,205.00	44,500.00	5,600.00
North Carolina	349,500	349,500.00	371,219.63	2,256.66	30,789.84	2,800.00	107,219.46	12,839.33	156,600.34	47,765.70	10,948.30
North Dakota	33,900	33,900.00	48,564.68	2,475.00	8,966.13	500.00	775.00	17,073.55	10,700.00	3,500.00	4,575.00
Ohio	264,700	264,700.00	413,334.88	4,200.00	26,328.65	10,590.00	8,900.00	90,781.80	213,920.00	50,924.43	7,690.00
Oklahoma	178,600	178,600.00	205,160.46	2,620.00	20,340.00	8,200.00	8,535.06	24,228.10	115,280.17	17,500.00	8,457.13

Oregon	44,750	44,750.00	49,965.41	5,190.35	3,295.00	4,400.00	7,540.00	7,163.30	16,398.24	5,826.32	152.20
Pennsylvania	338,900	338,900.00	377,062.98	3,115.00	28,395.00	6,940.00	10,200.00	63,235.00	187,960.00	54,312.98	22,905.00
Puerto Rico	192,800	192,800.00	152,951.29	5,412.50	11,207.50		23,497.50	15,169.97	92,485.68	4,118.14	
Rhode Island	26,500	26,500.00	27,744.00	3,000.00	3,190.00		491.76	14,029.24	2,700.00	4,333.00	
South Carolina	239,600	239,600.00	242,632.24	7,367.50	20,080.68	5,417.49	29,651.65	30,601.57	115,122.76	34,390.59	
South Dakota	34,600	25,300.00	39,457.81	2,100.00	3,480.00	1,000.00		20,127.81	7,200.00	2,500.00	3,050.00
Tennessee	253,600	253,600.00	271,395.38	6,139.37	17,554.29	1,560.00	38,555.43	45,943.52	128,142.77	29,000.00	4,500.00
Texas	547,000	547,000.00	447,932.60	7,425.00	16,600.00	4,500.00	47,756.80	132,694.94	199,608.50	29,082.36	10,265.00
Utah	27,600	27,600.00	32,223.97		2,890.00	100.00	8,340.00	4,458.67	5,970.50	10,464.80	
Vermont	18,300	18,300.00	22,466.86	1,320.00	6,485.00		945.00	2,400.00	9,000.00	2,316.86	
Virginia	251,800	251,800.00	256,396.20	6,500.00	41,125.82		9,270.00	28,866.25	114,507.93	56,126.20	
Virgin Islands	7,100	7,100.00	7,667.65			1,060.00		1,080.00	3,258.70	3,328.95	
Washington	70,500	70,500.00	100,324.18	3,758.94	8,343.41	4,950.00	33,909.66	19,961.28	20,650.00	7,608.39	1,142.50
West Virginia	103,400	103,400.00	112,934.00	1,771.00	6,070.00	4,500.00	9,068.71	19,060.00	50,994.29	18,790.00	2,680.00
Wisconsin	107,100	107,100.00	137,711.57	5,650.00	13,412.11	3,100.00	16,825.55	20,505.35	59,808.56	16,500.00	1,910.00
Wyoming	14,000	11,495.43	16,300.00					4,500.00	7,876.67	3,923.33	

Table 17.—*Budgetary allocation of Federal funds appropriated under the Venereal Disease Control Act, for the fiscal year 1943*

[As of Jan. 31, 1943]

State	Total allotted	Total pay	Total budgeted	Purpose for which budgeted							
				Administration	Consultation and technical information	Public education	Case-finding and case-holding	Laboratory	Treatment facilities	Drugs	Training
Total	$10,170,000	$9,325,057.42	$10,595,877.61	$236,420.33	$1,093,073.20	$254,777.21	$1,972,227.14	$2,064,263.71	$3,991,316.17	$752,248.00	$231,551.85
Alabama	432,700	432,700.00	354,513.68	5,860.00	49,308.33	7,900.00	62,885.00	33,820.00	181,123.35	7,030.00	6,587.00
Alaska	19,700	11,184.00	19,700.00	5,140.00	2,120.00	300.00		8,326.00	3,000.00	814.00	
Arizona	54,300	48,467.00	47,330.00		2,700.00	100.00	9,060.00	8,670.00	9,830.00	16,970.00	
Arkansas	232,000	172,570.00	223,753.78	9,913.42	12,026.66	5,400.00	53,948.05	21,772.35	113,213.30	5,000.00	2,480.00
California	429,100	424,113.49	429,600.00		84,709.15	1,709.83	89,285.62	78,162.50	156,989.02	13,243.88	5,500.00
Colorado	83,300	82,342.21	85,348.00	7,505.00	13,317.50	1,485.00	14,914.00	9,470.00	35,876.50	1,255.00	1,525.00
Connecticut	79,000	79,000.00	82,908.52	2,220.00	10,081.00	500.00	16,010.00	28,870.00	20,927.00	4,300.52	
Delaware	23,100	23,093.26	22,387.50	487.50	1,100.00		5,850.00	5,780.00	7,800.00	1,370.00	
Dist. Columbia	81,600	81,592.35	93,773.92	5,600.00	36,788.92	4,515.00	10,167.00	10,920.00	8,535.00	1,200.00	16,048.00
Florida	281,600	272,834.00	289,600.00	7,140.00	36,170.00	4,500.00	52,460.00	34,645.00	110,185.00	38,335.00	6,165.00
Georgia	468,400	468,400.00	498,705.41	6,120.00	21,530.00		115,985.00	64,140.00	264,627.07	26,303.34	
Hawaii	45,200	28,828.00	50,736.91	5,683.34	13,490.86	2,950.00	16,911.84	2,020.87	4,880.00	4,800.00	
Idaho	28,800	24,452.00	27,760.00	300.00	640.00		3,250.00	15,320.00	7,305.00	945.00	
Illinois	465,800	465,800.00	465,800.00	12,200.00	73,050.00	4,954.00	121,353.00	68,436.97	185,806.03		
Indiana	198,900	160,446.00	273,100.00	13,798.88	25,400.00	8,190.00	49,350.00	51,690.00	99,596.12	23,000.00	2,075.00
Iowa	144,200	112,015.00	121,212.00	6,900.00	7,738.00	1,500.00	35,435.00	32,169.00	27,440.00	10,000.00	30.00
Kansas	130,100	130,100.00	127,869.99	7,900.00	11,845.00	900.00	28,190.00	30,505.00	38,239.99	8,000.00	2,290.00
Kentucky	344,300	344,298.85	343,346.46	5,462.00	20,734.13	13,049.65	115,784.59	78,197.99	93,118.10	17,000.00	
Louisiana	349,300	335,431.85	350,640.00	8,025.25	39,463.75	15,700.00	44,155.00	59,290.00	171,106.00	11,000.00	1,900.00
Maine	43,100	40,565.95	56,180.00		1,500.00		11,178.00	13,250.00	28,251.00	2,001.00	
Maryland	139,700	120,428.00	181,152.66	6,916.67	9,097.00	1,650.00	14,883.00	23,087.00	88,538.99	500.00	36,480.00
Massachusetts	42,600	36,062.40	143,157.42		21,712.42	9,750.00	12,910.00	50,885.00	36,400.00		11,500.00
Michigan	260,200	236,204.00	261,700.00	11,880.00	26,598.00	10,730.00	41,631.00	65,371.00	79,746.00	21,500.00	4,244.00
Minnesota	137,000	136,441.91	128,695.21	3,732.63	19,984.00	7,220.00	10,389.00	65,631.83	18,237.75	3,500.00	
Mississippi	461,100	456,641.01	469,714.70		33,660.00	2,975.00	153,243.85	9,400.00	209,441.50	51,642.00	9,352.35
Missouri	212,500	182,612.00	270,692.66	7,700.00	16,335.00	16,000.00	53,035.00	56,780.00	118,192.66	1,000.00	1,650.00
Montana	21,600	13,390.00	18,530.00	240.00	950.00	850.00		9,970.00	2,020.00	4,500.00	
Nebraska	73,600	45,915.00	58,100.00	4,050.00	5,150.00	3,940.00	24,320.00	4,140.00	15,500.00		1,000.00
Nevada	10,300	9,424.00	11,800.00	900.00	500.00	800.00		810.00	6,340.00	2,450.00	
New Hampshire	26,500	23,133.00	26,975.00	1,497.65	6,692.35	200.00	4,610.00	5,050.00	5,800.00	3,000.00	125.00
New Jersey	188,600	178,359.00	196,528.80	9,830.00	43,821.00	4,750.00	29,700.00	47,881.00	26,435.50	30,961.30	3,150.00
New Mexico	54,400	53,994.00	54,648.76	5,666.83	5,038.76	1,415.18	12,210.00	3,129.16	25,762.83	986.00	440.00
New York	529,300	499,931.00	563,314.20		61,176.00	4,860.00	79,750.00	276,028.20	93,420.00	42,400.00	5,680.00
North Carolina	455,000	452,253.94	499,235.00	7,120.95	46,304.00	36,336.05	159,655.00	19,265.00	165,673.00	45,811.00	19,070.00
North Dakota	19,000	15,782.00	38,936.67	2,070.00	1,815.00	4,420.00	8,340.00	12,041.67	7,750.00	2,500.00	

Ohio	352,600	214,432.00	356,266.00	1,200.00	36,690.00	7,900.00	12,760.00	71,000.00	194,860.00	24,166.00	7,690.00
Oklahoma	220,700	218,015.63	261,579.67	4,355.00	42,300.00	9,000.00	19,840.00	38,592.50	128,642.17	5,900.00	12,950.00
Oregon	89,000	82,317.00	87,434.33	4,370.00	4,820.00	1,000.00	20,675.00	21,836.00	29,733.33	5,000.00	
Pennsylvania	425,400	383,566.00	452,647.50	8,382.00	47,722.00	17,662.50	53,086.33	73,749.67	205,110.00	23,272.00	23,663.00
Puerto Rico	313,200	242,251.00	134,754.00	2,850.00	18,900.00	560.00	28,470.00	8,840.00	75,134.00		
Rhode Island	37,300	33,260.00	37,303.51	4,500.00	1,580.00			16,823.51	9,400.00	5,000.00	
South Carolina	338,200	338,200.00	341,125.00	9,060.00	53,820.00	6,620.00	58,001.00	44,121.33	124,964.72	42,037.95	2,500 00
South Dakota	41,300	35,630.00	38,804.40	2,225.00	3,280.00	400.00	3,225.00	19,808.00	7,703.90	1,500.00	662.50
Tennessee	320,600	240,240.00	311,817.36	4,134.00	18,344.00	2,685.00	75,108.86	30,658.00	138,187.50	36,000.00	6,700.00
Texas	667,000	654,963.00	811,805.50	11,005.00	29,950.00	12,900.00	102,323.00	305,243.00	273,294.50	40,000.00	37,090.00
Utah	46,000	26,366.00	32,962.21	1,469.21	4,880.00	950.00	11,700.00	6,598.50	4,772.50	2,592.00	
Vermont	14,400	13,636.87	22,200.00	1,380.00	3,260.00		3,300.00	1,860.00	8,900.00	3,500.00	
Virginia	342,600	291,387.00	363,380.00		27,120.00		17,670.00	23,386.66	175,521.84	119,681.50	
Virgin Islands	9,500	105,895.00	9,185.88		1,030.37			480.00	5,635.00	2,040.51	
Washington	107,100	113,808.00	120,030.00	1,320.00	12,570.00	2,100.00	40,470.00	36,365.00	14,605.00	12,000.00	600.00
West Virginia	136,700	111,949.70	161,420.00	1,650.00	11,170.00	11,750.00	20,164.00	34,526.00	58,225.00	22,000.00	1,935.00
Wisconsin	123,300	10,835.00	149,805.00	6,660.00	12,370.00	1,500.00	43,865.00	23,450.00	60,860.00	1,100.00	
Wyoming	19,200	9,500.00	15,910.00		720.00	200.00	720.00	2,000.00	8,660.00	3,140.00	470.00

Table 18.—*Annual rates per 1,000 population for syphilis and gonorrhea in 44 cities with a population of 200,000 or over, as reported by the city health officer for the fiscal years 1942 and 1943* [1]

City	Annual rates per 1,000 population			
	Syphilis		Gonorrhea	
	1942	1943	1942	1943
Akron	3.5	5.73	1.3	1.08
Atlanta	[2] 10.9	11.41	3.0	3.26
Baltimore	8.8	16.75	3.5	4.79
Birmingham	17.8	26.63	2.3	4.10
Boston	2.3	2.83	1.5	1.66
Buffalo	2.7	3.40	1.1	1.57
Chicago	4.4	5.44	4.2	4.06
Cincinnati	6.4	7.99	2.3	2.16
Cleveland	3.7	4.38	1.7	1.74
Columbus	4.4	4.99	1.0	1.52
Dallas	10.0	12.17	6.2	4.19
Dayton	3.7	6.23	.9	1.48
Denver	[2] 6.9	6.98	3.4	3.32
Detroit	4.2	5.09	3.1	3.12
Honolulu	[3] 1.8	2.93	3.6	5.13
Houston	8.8	12.09	2.9	2.17
Indianapolis	5.4	11.23	1.5	1.79
Jersey City	1.9	2.58	.4	.15
Kansas City	4.1	5.60	1.3	2.13
Los Angeles	4.1	5.74	2.9	3.36
Louisville	6.9	10.22	4.3	4.40
Memphis	26.4	29.10	9.8	7.76
Milwaukee	.9	.91	.2	.25
Minneapolis	1.7	1.74	1.5	1.37
Newark	7.9	6.30	2.8	2.68
New Orleans	4.2	8.15	2.4	2.23
New York	3.9	3.74	1.6	1.61
Oakland	2.5	3.89	2.0	2.85
Oklahoma City	11.8	9.36	3.0	3.86
Omaha	4.2	5.45	2.1	3.88
Philadelphia	1.3	1.67	.3	.09
Pittsburgh	8.6	12.10	.5	.24
Portland	1.7	2.57	1.3	2.15
Providence	2.8	2.37	1.1	.58
Rochester	.9	.97	1.0	.66
St. Louis	11.4	6.64	2.6	1.71
St. Paul	1.3	1.88	.7	.74
San Antonio	8.0	6.31	3.1	4.14
San Diego	3.7	5.80	4.9	3.83
San Francisco	3.3	5.94	3.0	5.30
Seattle	3.3	3.68	3.2	3.64
Syracuse	2.8	3.51	.3	.54
Toledo	2.3	2.47	.8	.69
Washington, D. C	15.1	10.43	5.8	4.47
Total	4.9	5.77	2.3	2.40

[1] Estimate based on first 6 months of fiscal year 1943.
[2] Estimate based on actual reports for 10 months.
[3] Estimate based on actual reports for 7 months.

Table 19.—*Patients treated and treatments given at the U. S. Public Health Service Medical Center, Hot Springs National Park, Ark., 1922 to 1943, inclusive*

Year	Number of applicants	Number of cases treated			Treatments given [1]
		Total venereal disease patients	Syphilis	Gonorrhea	
Total	117,868	81,295	30,717	28,617	1,745,355
1922	2,720	1,775	1,182	593	43,830
1923	3,389	1,854	1,326	528	41,559
1924	3,676	2,186	1,447	739	50,683
1925	3,411	2,782	2,011	771	50,608
1926	3,570	3,064	2,211	853	54,599
1927	4,757	3,682	2,504	1,178	58,489
1928	5,467	4,134	2,626	1,508	72,466
1929	5,265	3,986	2,512	1,474	75,519
1930	5,704	4,441	2,743	1,698	79,180
1931	4,881	5,088	2,776	2,312	66,246
1932	5,106	6,184	3,188	2,996	93,707
1933	4,036	4,485	2,850	1,635	73,466
1934	6,682	5,607	3,330	2,277	124,004
1935	14,946	8,032	5,272	2,760	198,051
1936	8,490	4,630	3,368	1,262	141,446
1937	6,806	4,217	2,974	1,243	110,336
1938	6,209	3,664	2,863	1,078	108,337
1939	5,272	2,743	2,074	797	101,169
1940	4,662	2,290	1,702	685	71,756
1941	4,059	1,742	1,168	616	46,111
1942	4,245	2,237	1,548	723	28,657
1943	4,515	2,472	1,614	891	55,145

[1] Baths not included.

Table 20.—*Patient movement at the U. S. Public Health Service Hospitals, Lexington, Ky., and Fort Worth, Tex., for the fiscal years 1942 and 1943*

	Lexington				For Worth	
	Male		Female		Male	
	1942	1943	1942	1943	1942	1943
Population at end of previous fiscal year (June 30):						
Addict patients	793	1,026	0	67	619	295
Executive order patients	0	1	0	0	0	502
	793	1,027	0	67	619	797
ADMITTED DURING FISCAL YEAR						
Prisoners:						
Received direct from U. S. courts	356	370	26	73	149	108
Received by transfer from other Federal institutions	365	166	15	2	126	24
Conditional release violators returned	63	61	1	0	59	17
Parole violators returned	5	3	0	0	1	1
Returned from escape	5	6	0	2	4	2
Returned from writ, leave, etc	27	35	0	2	20	3
Held awaiting trial	8	5	0	2	3	0
Returned by U. S. marshal from operation	1	3	0	0	0	0
Returned from funeral	0	5	0	0	0	0
Returned from visit	0	1	0	0	0	2
Received from U. S. marshal for observation and mental examination	0	1	0	0	0	0
Restored to custody	1	0	0	0	0	0
Held for U. S. Commissioner	0	0	0	0	0	1
	831	656	42	81	362	158
Probationers:						
Received direct from U. S. courts	52	70	9	16	21	11
Received by transfer from other Federal institutions	2	0	1	0	0	0
Returned from writ, leave, etc	12	14	2	10	0	0
Returned for further treatment	11	4	0	0	0	0
Returned for observation	0	1	0	0	0	0
Status changed, prisoner to probationer	1	0	0	0	0	0
Status changed, voluntary to probationer	1	0	0	0	0	0
	79	89	12	26	21	11
Voluntary patients	558	618	229	290	389	213
Ex-prisoner patients	0	1	0	0	0	0
Executive order patients	1	36	0	0	503	701
U. S. Army patients	0	4	0	0	0	0
Total admissions	1,469	1,404	283	397	1,275	1,083
Grand total	2,262	2,431	283	464	1,894	1,880
DISCHARGED DURING FISCAL YEAR						
Prisoners, cured:						
On parole, prognosis good	7	19	0	2	29	24
On parole, prognosis guarded	16	17	0	0	2	3
On parole, prognosis poor	2	3	0	1	0	0
On conditional release, prognosis good	27	10	2	3	31	4
On conditional release, prognosis guarded	251	206	2	7	157	109
On conditional release, prognosis poor	96	215	3	4	127	33
Short term expiration, prognosis good	1	2	0	0	0	0
Short term expiration, prognosis guarded	11	17	1	2	0	0
Short term expiration, prognosis poor	2	13	0	1	0	0
Maximum expiration, prognosis guarded	1	0	0	0	0	0
Maximum expiration, prognosis poor	4	0	0	0	0	0
Sentence reduced to expire forthwith, prognosis good	0	1	0	1	0	0
Sentence reduced to expire forthwith, prognosis guarded	14	2	1	0	0	0
Sentence reduced to expire forthwith, prognosis poor	1	1	0	0	0	0
Reconditional release, prognosis guarded	0	0	0	0	1	0
Prisoners improved:						
Full term expiration, prognosis guarded	26	38	0	2	0	0
Full term expiration, prognosis poor	51	59	1	0	88	34
Transferred to other Federal institutions	18	50	0	2	200	112
To U. S. marshal for trial	3	4	0	1	2	0
On writ of habeas corpus, leave, etc	32	32	0	2	21	3
Order U. S. Commissioner	0	0	0	0	0	1
Escape	12	7	0	2	4	5
Restored to supervision	1	1	0	0	0	0

Table 20.—*Patient movement at the U. S. Public Health Service Hospitals, Lexington, Ky., and Fort Worth, Tex., for the fiscal years 1942 and 1943*—Continued

	Lexington				Fort Worth	
	Male		Female		Male	
	1942	1943	1942	1943	1942	1943
DISCHARGED DURING FISCAL YEAR—CON.						
Prisoners improved—Continued.						
To funeral	1	4	0	0	0	0
To U. S. marshal for operation	2	4	0	0	0	0
To U. S. marshal for hearing	3	2	0	0	0	0
Visit	0	1	0	0	0	2
Death	11	7	2	0	4	1
Status changed	1	0	0	0	3	5
	594	715	12	30	669	336
Probationers:						
Cured, prognosis good	17	2	1	1	7	4
Cured, prognosis guarded	55	38	2	10	5	10
Cured, prognosis poor	15	14	1	0	1	4
On writ of habeas corpus, leave etc., improved	16	17	2	11	0	0
Death	2	0	0	0	0	0
Observation study completed	0	1	0	0	0	0
Against medical advice	0	0	0	1	0	0
To U. S. Immigration and Naturalization Service for deportation	1	0	0	0	0	0
Transferred to U. S. Public Health Service Hospital, Lexington, Ky	0	0	0	0	2	0
	106	72	6	23	15	18
Voluntaries, cured:						
Prognosis, good	6	4	3	3	9	2
Prognosis, guarded	19	23	5	16	13	13
Prognosis, poor	8	18	2	8	2	2
Voluntaries, maximum benefit:						
Prognosis, guarded	1	0	0	0	5	8
Prognosis, poor	0	1	0	0	12	12
Other Voluntaries:						
Against medical advice, prognosis poor	444	502	174	233	278	157
Detriment to station	0	0	0	0	1	1
Observation study completed, prognosis good	2	0	0	1	0	0
Not entitled to further treatment, improved	2	1	0	0	0	0
On leave of absence, improved	47	39	12	29	0	0
Failure to return from leave of absence, prognosis poor	0	22	0	6	86	21
Death	5	4	2	2	4	8
Fugitive, released to peace officer	0	0	0	0	2	0
Status changed, voluntary to probationer	1	1	0	0	0	0
Status changed, voluntary to prisoner	0	1	0	0	0	0
To U. S. marshal	0	1	0	0	0	0
Not in need of further treatment, improved	0	0	0	1	0	0
Alien, not entitled to treatment, improved	0	5	0	0	0	0
	535	622	198	299	412	224
Ex-prisoner patient: Maxmum benefit, improved	0	1	0	0	0	0
Executive order patients:						
Recovered	0	0	0	0	0	20
Improved	0	14	0	0	0	324
Not improved	0	0	0	0	0	24
Against medical advice	0	1	0	0	0	24
Death	0	0	0	0	1	12
Elopement	0	0	0	0	0	4
Not psychotic	0	0	0	0	0	36
Status changed	0	0	0	0	0	1
Transferred	0	2	0	0	0	0
On furlough June 30, 1943	0	0	0	0	0	28
	0	17	0	0	1	473
U. S. Army patients: Recovered	0	4	0	0	0	0
Total discharges	1,235	1,431	216	352	1,097	1,051
Population at end of current fiscal year (June 30):						
Addict patients	1,027	980	67	112	295	99
Executive order	0	20	0	0	502	730
Total	1,027	1,000	67	112	797	829
Average daily population for the fiscal year	850	974	51	86	576	851

Table 21.—*Out-patient medical services in Federal and correctional institutions (exclusive of the medical center for Federal prisoners, Springfield, Mo.), fiscal years 1942 and 1943* [1]

	1942												1943											
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
(1) Individual inmates who reported to sick line during the month	13,019	12,559	12,671	13,263	13,032	13,322	13,640	12,505	12,768	11,644	12,433	12,590	11,420	11,517	11,127	11,708	11,370	11,942	11,084	10,769	11,492	10,664	11,552	10,617
(2) Number of times individual inmates listed under (1) reported to sick line during the month	65,340	67,635	61,563	63,869	59,444	62,494	62,460	54,612	55,328	52,522	56,480	57,440	55,676	51,821	46,904	46,344	46,548	52,822	57,794	54,614	56,858	58,580	58,400	56,744
(3) Number of treatments given, in all out-patient clinics, to inmates reporting to sick line during month	106,962	103,543	95,915	103,830	97,373	103,892	103,362	92,075	93,272	88,031	92,982	92,674	68,984	63,840	59,818	63,188	64,136	68,083	67,300	62,930	66,009	66,618	65,481	63,971
(4) Sentenced population at beginning of each month	18,690	18,243	17,446	16,904	17,325	17,627	17,546	17,371	17,083	17,107	17,096	17,531	16,518	16,298	15,652	14,983	15,080	15,092	14,834	14,799	14,599	14,498	14,555	14,546
(5) Court commitments under sentence during each month	990	612	914	1,689	1,503	1,403	1,056	891	1,228	1,295	1,505	1,377	1,014	565	638	1,447	1,197	1,122	984	816	1,011	1,097	985	980
Total	19,680	18,855	18,360	18,593	18,828	19,030	18,602	18,262	18,311	18,402	18,601	18,908	17,532	16,863	16,290	16,430	16,277	16,214	15,818	15,615	15,610	15,595	15,540	15,526

[1] The above figures do not include treatment given in-patients treated in out-patient departments.

Table 22.—*Movement of patient population of St. Elizabeths Hospital from June 30, 1941, to June 30, 1942*

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1941	3,359	1,095	4,454	1,502	927	2,429	6,883
Admitted during year ended June 30, 1942	1,009	246	1,255	365	177	542	1,797
Total number under care and treatment during year ended June 30, 1942	4,368	1,341	5,709	1,867	1,104	2,971	8,680
Discharged as—							
Not insane	30	0	30	3	0	3	33
Recovered	280	58	338	60	51	111	449
Improved	306	50	356	39	31	70	426
Unimproved	526	44	570	47	9	56	626
Total discharged	1,142	152	1,294	149	91	240	1,534
Died	141	84	225	90	56	146	371
Total of patients discharged and dead	1,283	236	1,519	239	147	386	1,905
Number of patients remaining on rolls June 30, 1942	3,085	1,105	4,190	1,628	957	2,585	6,775

Table 23.—*Movement of patient population at St. Elizabeths Hospital from June 30, 1942, to June 30, 1943*

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1942	3,085	1,105	4,190	1,628	957	2,585	6,775
Admitted during year ended June 30, 1943	1,474	278	1,752	397	175	572	2,324
Total number under care and treatment during year ended June 30, 1943	4,559	1,383	5,942	2,025	1,132	3,157	9,099
Discharged as—							
Not insane	33	8	41	2	0	2	43
Recovered	572	65	637	94	49	143	780
Improved	296	35	331	80	24	104	435
Unimproved	146	16	162	64	7	71	233
Total discharged	1,047	124	1,171	240	80	320	1,491
Died	161	84	245	112	63	175	420
Total of patients discharged and dead	1,208	208	1,416	352	143	495	1,911
Number of patients remaining on rolls June 30, 1943	3,351	1,175	4,526	1,673	989	2,662	7,188
Patients on visit and elopement June 30, 1943	117	43	160	126	80	206	366
Number of patients in Hospital June 30, 1943	3,234	1,132	4,366	1,547	909	2,456	6,822

Table 24.—*Average number of patients in St. Elizabeths Hospital from 1930 to 1943*

1930	4,390	1937	5,538
1931	4,601	1938	5,836
1932	4,798	1939	6,108
1933	5,036	1940	6,395
1934	5,049	1941	6,663
1935	5,267	1942	6,994
1936	5,373	1943	7,031

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Table 25.—*Admissions to and discharges from St. Elizabeths Hospital from 1929 to 1943*

Fiscal year	Total admissions	Total discharged	Percent discharged in relation to admissions	Total deaths
1929	756	316	41.80	252
1930	706	330	46.76	203
1931	851	422	49 59	211
1932	858	401	46.74	248
1933	911	582	63.89	278
1934	894	426	47.65	258
1935	824	396	48.06	304
1936	925	552	59.68	298
1937	1,099	490	44.59	332
1938	1,029	461	44.80	267
1939	1,056	469	44.41	281
1940	1,202	619	51.50	322
1941	1,503	773	51.43	382
1942	1,797	1,534	[1] 84.36	371
1943	2,324	1,491	64.15	420

[1] 63.10 without transfer of 400.