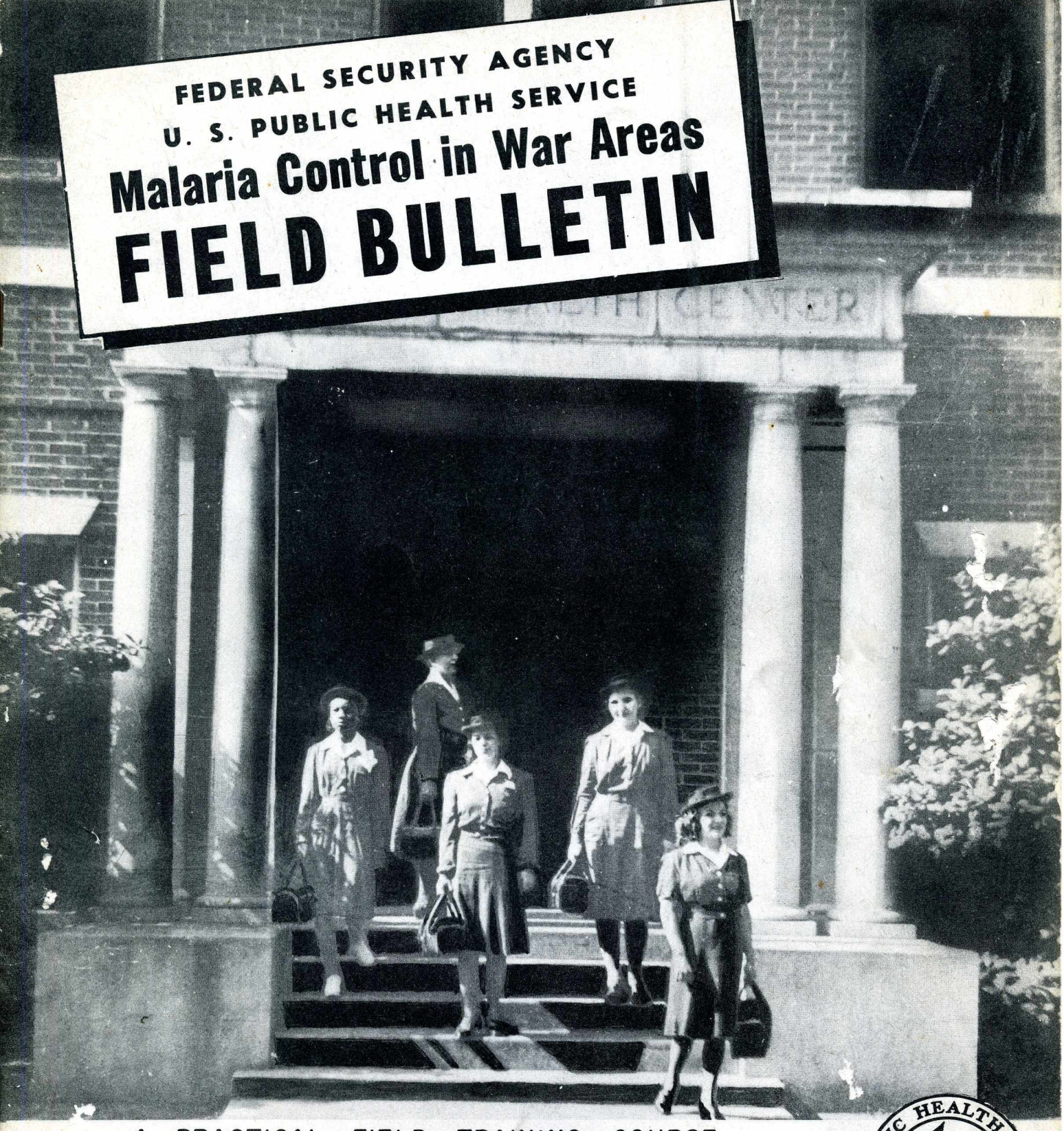
FEDERAL SECURITY AGENCY

U. S. PUBLIC HEALTH SERVICE

Malaria Control in War Areas

FIELD BULLETIN



A PRACTICAL FIELD TRAINING COURSE
FOR PUBLIC HEALTH PERSONNEL

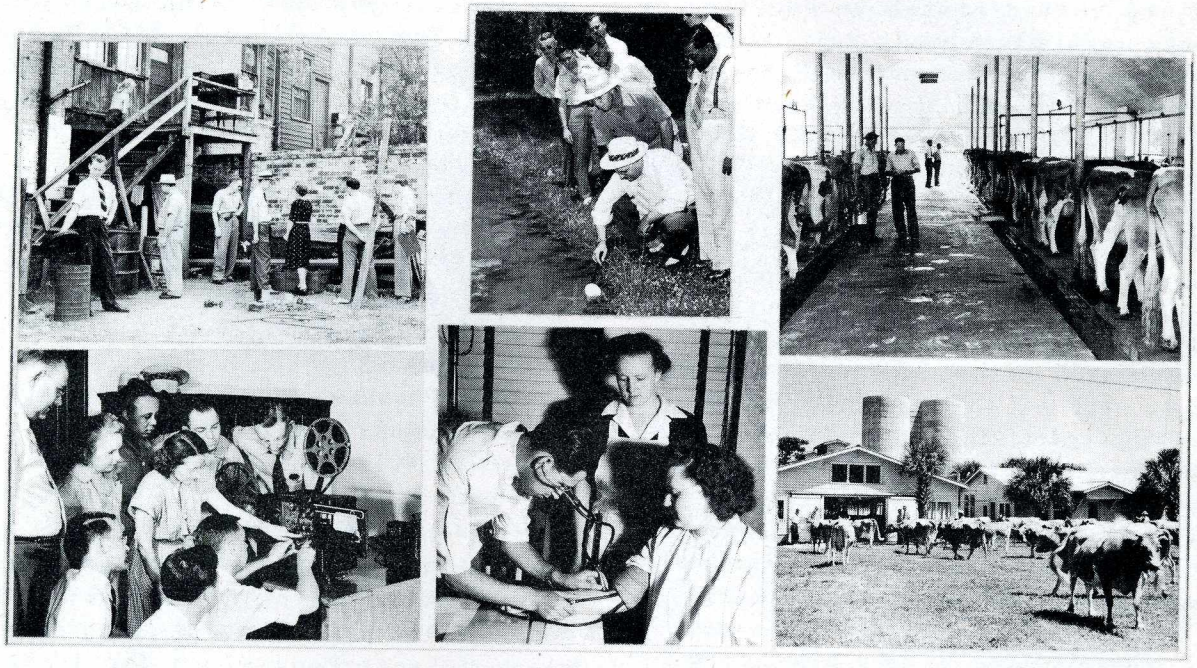
ATLANTA, GEORGIA

APRIL, MAY, JUNE, 1946

U.S. PUBLIC HEALTH SERVICE ★ 1798 ★

CONTENTS

A PRACTICAL FIELD TRAINING COURSE FOR PUBLIC HEALTH PERSONNEL



During the last few years, public health work has expanded to an unprecedented extent. Demands for qualified public health personnel rapidly depleted rosters in all professions. Responsible agencies initiated various programs for training the needed medical, engineering, nursing, sanitation, and administrative officers. In July 1945, Dr. J. W. Mountin, Chief of States Relations Division of the U. S. Public Health Service, suggested that a practical training program or internship in public health be developed. The basic objective of this program was to provide practical field training for public health workers.

The initial concept of the program was that trainees would obtain experience under competent supervision in representative local health departments. It was expected that persons taking the course would have varied backgrounds of experience and training. The training was not intended to be a series of supervised observations; rather the trainees would experience the problems and their solutions involved in operations of health units. Basic information concerning organization, policy, and evaluation of procedure would necessarily be supplied by verbal instruction.

The plan of field training and instruction is not to supplant academic training offered in schools of public health. The objective is to supplement formal instruction with actual field experience. The first class started January 1, 1946; the second, April 1. So far, the interns have come from U. S. Public Health Service Districts 2, 3, and 4. The next class, which will begin in September, will consist of interns from other sections of the United States in addition to those named already. To date, more than sixty persons have received the field training course, or at least a part of it. Thirty have completed the work offered in Savannah.

The slogan of this practical course is "Learn by Doing." Each day trainees carry on practical work in connection with health department activities. A discussion period is scheduled for the end of each day, so the conference method is utilized in summarizing the public health significance of each day's work. The teaching staff of the U. S. Public Health Service supervises the training very closely so there is no interference with the regular work of the health department staff.

SELECTION OF TRAINING AREA

Since training would necessarily be given in a health department, a survey was made to determine where a large number of trainees could be handled with a minimum of interference to the normal activities of the staff.

The Savannah-Chatham County Health Department at Savannah, Georgia, was selected as a suitable place for the first project. A well-qualified staff, a wide variety of health activities, and operations representative of local health departments were available. To launch the program it was necessary only to augment personnel in the department.

LAUNCHING THE PROGRAM

Dr. Clair Henderson, Director of the Savannah-Chatham County Health Department and the Georgia Department of Public Health, through its Division of Local Health Organization, agreed to cooperate in the new program. Classroom, clinical, laboratory, and field facilities were provided by the local health department.

The responsibility for developing the program was delegated to Senior Sanitary Engineer Ellis S. Tisdale and Senior Assistant Surgeon Robert H. English of the Training Division, M.C.W.A., U. S. Public Health Service, who were to work cooperatively with Dr. Henderson in planning the work. The following professional workers have been assigned to the training course:

H. E. Eagan, Training Officer
Madeline Pershing, Public Health Nurse, Asst. Nurse Officer (R)
Clark Peckham, S. A. Sanitarian (R)
Ruth Sumner, Health Educator
Robert Wilson, Record Analyst
Robert B. Carson, S.A. Sanitarian (R)
George W. Gehres, S.A. Sanitarian (R)

Training aids, equipment, and supplies to be used in giving this program are made available from the Training Division, Malaria Control in War Areas, United States Public Health Service, Atlanta, Georgia.

PERSONNEL ATTENDING COURSES

After the program had started functioning, it was found that three general groups were represented in the field training courses. These include:

1. Individuals who have a basic academic degree and who plan to continue academic work leading to an advanced degree in public health. Usually these people have not had operational experience in public health work and need basic instruction and observation in public health activities.

2. Professional workers who have completed their formal academic training in public health work, and who need practical field experience before entering employment on a public health program. The field training courses help to bridge the gap between academic training and the application of public health methods.

3. Persons without academic degrees who require training at a sub-professional level to qualify them for positions in health departments.

Naturally the type of training differs somewhat among the three groups and is determined largely by the background and training of the interns. Care is maintained in the preparation and carrying out of course work so that the training is sufficiently broad in scope to meet the needs of the various types of personnel found in health departments. For practical purposes, classes of fifteen or less are desirable.

PLAN OF COURSE

The internship lasts for twelve weeks. The course is divided into a three-week period of general orientation in public health organization and methods, and a nine-week period of field demonstrations and training.

Trainees spend the first week and a half of the twelve-week course in Atlanta. The time is spent in studying federal and state public health activities and policies. Material indicated in the following outline is included in the course at Atlanta:

1. Explanation of organization and functions of the U. S. Public Health Service.

2. Discussion of relations of U. S. Public Health Service with state and local health departments. Emphasis is placed on the importance of the community program through the entire course.

3. A brief introduction to epidemiology, including definitions, technics, and interpretation of data.

4. Introduction to study of communicable diseases, including etiology, epidemiology, and prevention.

5. An introduction to general public health laboratory methods. Lectures are supplemented by a visit to the laboratories of the Georgia Department of Public Health.

The remainder of the course is conducted at the Savannah-Chatham County Health Department in Savannah, Georgia. Numerous facilities are utilized in this area. This health department operates as a joint city-county health center. More than thirty separate organizations contribute financially or with personal service to the health program of the community. High standards are maintained and a merit system is in effect. The following facilities are available:

SAVANNAH-CHATHAM COUNTY HEALTH CENTER. The following clinics are conducted by the Center:

Pediatric (white and colored).
Tuberculosis (white and colored).
Eye, Ear, Nost, and Throat (white). (Patients are referred to doctors offices.)
Gynecological (white).
Dental (white and colored).
Orthopedic (white and colored).
Prenatal (white and colored).
Venereal Disease (white and colored).
Child Health (colored).
Cancer (white and colored).
City Immunization Clinics (white and colored).

U.S.P.H.S. CARTER MEMORIAL LABORATORY. This laboratory is engaged in various problems of operational research. Primary attention is given to developing materials and equipment used in controlling arthropod and rodent vectors or reservoirs of disease. An opportunity is afforded for observation of experimental technics. Methods of evaluating procedures are demonstrated.

SOUTHEASTERN MEDICAL CENTER. Rapid treatment technics for venereal diseases are employed at this hospital. Trainees are given an opportunity to observe the work in progress.

MUNICIPAL WATER AND SEWAGE PLANT OBSERVATION. The Water Treatment Plant and the Sewage Disposal Plant in Augusta are visited. Modern water treatment and sewage disposal methods are demonstrated.

OUTLINE OF TRAINING

GENERAL INSTRUCTIONS AND OBSERVATIONS. In addition to the orientation course in Atlanta, certain other instructions are of general importance. For the most part, these are basic technics or functions which every person involved in public health work will have to perform regardless of his professional role.

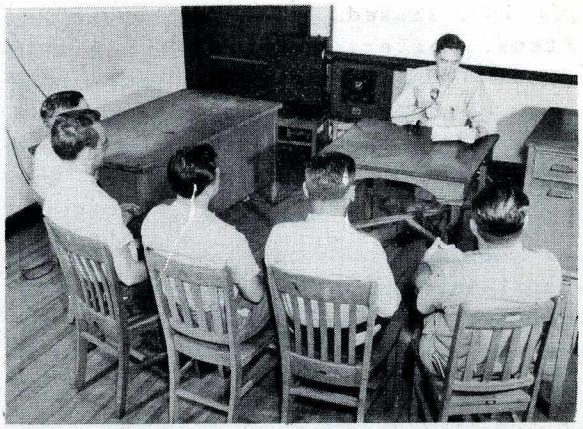
The facilities mentioned above are included in a general survey inspection by the entire group. Later certain members of the group work intensively in various capacities on the different programs.

In addition to the field trips, subjects indicated below are included in the general instruction. All of these are amplified and studied with particular respect to the various professions after the class begins its study in separate groups.

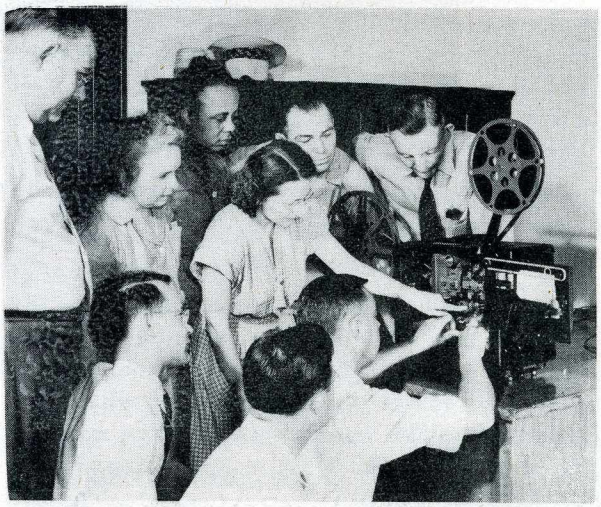
TRAINING IN PUBLIC SPEAKING. This is an important part of the general course for all the interns. Presentation of material to various citizen groups is essential to satisfactory operation of health departments. Members of a health department should be capable of explaining health programs to the public and of estimating public interest. Each intern is required to practice and develop his speaking ability.

Methods of speech preparation as well as presentation are taught. Each trainee has the opportunity to present a talk which he has prepared to the group. The speech is recorded so that defects of speech and technic of delivery can be studied.

Speaking before a microphone as well as in front of an audience is practiced by all the students.



AUDIO-VISUAL AIDS IN PUBLIC HEALTH EDUCATION. Equally important as speaking ability is the proper use of audio-visual materials. Motion pictures and film strips are being used widely in public health education. Trainees are taught proper use of equipment, and technics of evaluating teaching materials. Representative films and film strips are shown and discussed critically by the group with competent supervision. Instructions on the accumulation and use of film libraries are supplied. Instruction is given in the preparation and evaluation of news items,



All interns learn how to use projectors.

pamphlets, and posters. The importance of this type of material in disseminating information to large groups of people is stressed. Trainees prepare news items, posters, and pamphlets under careful supervision. News items presented for press release are criticized from all points of view. The field training serves as a testing ground where misconceptions and faulty educational technics may be detected. Mistakes made here need not be repeated after the intern leaves the training area and goes to his own health department.

Each trainee acts as a representative of the Savannah-Chatham County Health Department while engaged in field work. He is given a card which states that he is an official representative of the local health department. When this card is issued, his personal responsibility as a health department representative is indicated.

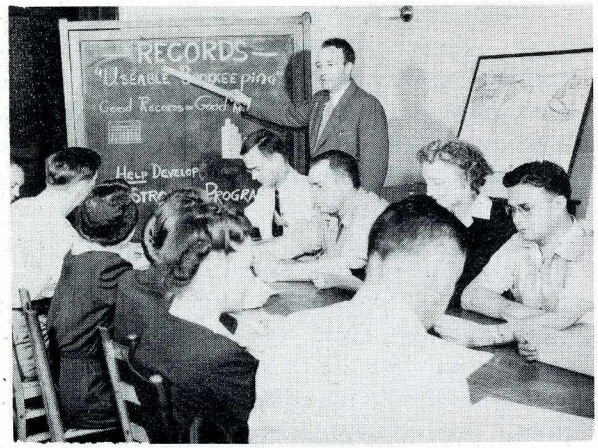
RECORDS AND STATISTICS. The basic importance of vital statistics is stressed. Attention is given to proper organization of records, statistical analysis, and epidemiological studies.

Class evaluates material found in pamphlets, booklets, and other available sources of information.

INDIVIDUAL RESPONSIBILITY ON HEALTH PROGRAM. An effort is made to impress trainees that their personal influence is more extensive than their assigned duties. Each individual is taught that he is a personal health educator and should not miss an opportunity to present basic health information in his daily work.

Forms and files for reporting of diseases and for recording of births and deaths are demonstrated. The correlation between local, state, and federal records is explained, and the interdependence of these records to epidemiology is outlined.

Departmental report forms and individual records are prepared and evaluated.



Class studying records and statistics. Record analysts review the entire field of records used by health departments.

ENVIRONMENTAL SANITATION. A general practical course in environmental sanitation is given to all the trainees. All the public health personnel can benefit greatly from this part of the course, through the opportunity afforded them to learn and evaluate this type of work.

SUMMARIZING AND EVALUATING WORK OF TRAINEES. The trainee is not given a formal examination covering each week's work on specific projects or units. However, testing is accomplished through the preparation of practical health education projects such as pamphlets, talks, radio programs, and news articles on each specific subject. Each trainee presents his material to the entire class for discussion and evaluation.

SPECIFIC TRAINING FOR PROFESSIONAL GROUPS

After the general orientation, the class is divided into groups to receive specialized instruction. The groups consist of health officers and health administrators, sanitary engineers, public health nurses, veterinarians, sanitarians, health educators, and record analysts. The following outlines indicate in detail instruction given the professional groups:

PROGRAM FOR HEALTH OFFICERS AND HEALTH ADMINISTRATORS

General activities of health administrators are discussed. In addition to subjects listed in the general group, the following are covered: (1) Health department administration; (2) Personnel management; (3) Budget preparation; (4) Cooperation with official and civic organizations; (5) Clinical and field activities; and (6) Sanitation.

1. Health Department Administration

Interns in this group receive detailed training in organization and administration of health agencies. Responsibilities and financing of local departments are discussed. Planning in the local organizations receives considerable attention in regard to both organization and physical facilities.

2. Personnel Management.

This problem is of varying degrees of concern in different departments. Attention is given in the course to such basic problems as merit systems, personnel qualifications, and relationships of the different professions in the health department. Personnel policies which have proved satisfactory are outlined.

Each intern makes an outline of personnel regulations and policies at the conclusion of this portion of the course.

3. Budget Preparation.

As one phase of planning in health units, trainees are taught the principles of financing health departments. Methods of making estimates for anticipated activities and for unexpected exigencies are outlined. The use and availability of funds from various sources are discussed.

4. Cooperation with Official and Civic Organizations

During the training period interns have the opportunity to work with official and civic agencies interested in public health activities. Part of the time is spent in talking with various persons in the community and in getting public reactions to the existing health programs.

The following projects are completed by the trainees during the course of the field training:

(a) Attend a meeting of the Board of Health. Record and interpret proceedings. Prepare an outline appropriate for the meeting.

(b) Attend a meeting of an appropriation body. Observe and outline technics which might be used in securing a satisfactory appropriation.

(c) Receive complaints or requests of citizens and solve these problems.

(d) Work with civic organizations to develop a program on some problem related to health.

(e) Visit a key person in a community and enlist his support in a public program.

(f) Receive requests from an official agency for assistance with a public health problem.

5. Clinical and Field Activities.

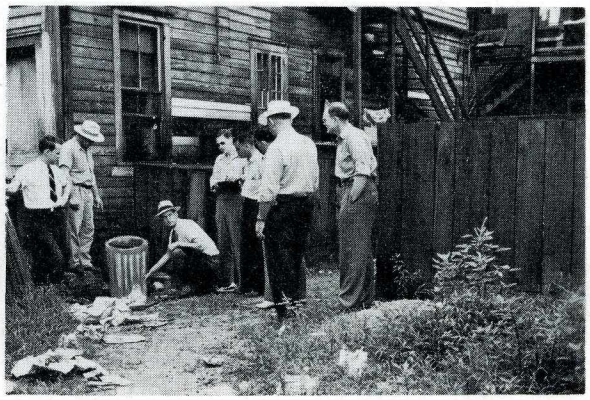
A study is made of public health clinics, their management, and programs. Interns work in the various health department clinics and study methods used to meet the local problems. Consideration is given to operation of these facilities. Problems relating to treatment, operating cost records, and professional relations are considered.

Equal attention is given to home nursing visits. Interns make a number of home visits with field nurses. Types of service rendered, technics employed, and results achieved are studied. As part of the training in this field, the intern has a number of conferences with the director and the supervisors of nursing. In this way, all phases of the public health nursing program are discussed. This experience permits a critical selection of methods applicable to the areas which the intern will latter serve.

Visiting nurse making a home call.

6. Sanitation.

Health officers and health administrators spend part of their time studying environmental sanitation. The basic problems of community and individual premise sanitation, both rural and urban, are considered.



Inspector points out many premise features which are attractive to rats.

Problems of water treatment, and sewage and garbage disposal are studied. These discussions are supplemented by visits to modern facilities in the area. Comments of these visits are solicited from the participants.

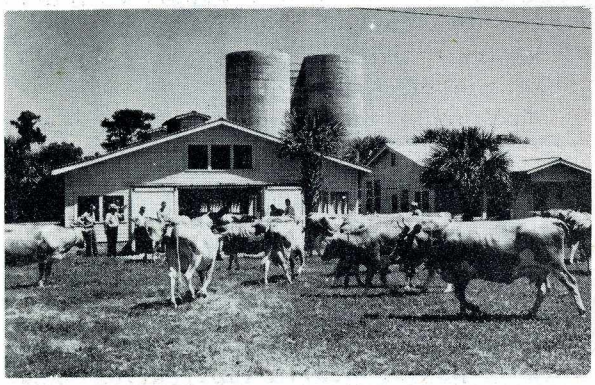
Different types of pasteurizing plants are visited. Methods of laboratory analysis are studied. Thorough familiarity with the U. S. Public Health Service Recommended Milk Ordinance and code, as well as local regulations is required.

Other community sanitation problems involve public health implication. Regulation concerning each is discussed and explained.

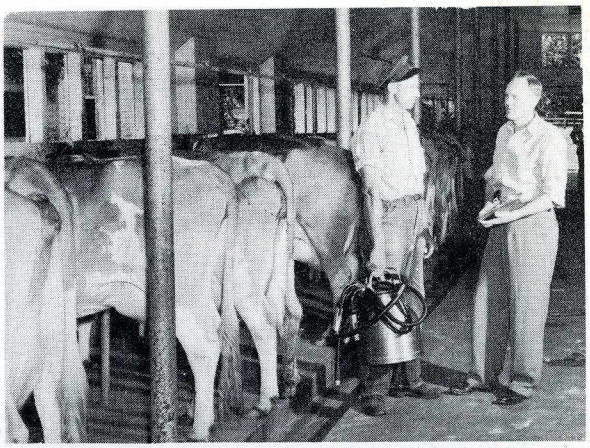
Rural sanitation is studied in visits to homes and rural premises. Types of water supplies and waste disposal are noted and discussed. A program for improving local sanitation in a selected area is made. The outline includes finances needed, technics to be used in the development of such a program, and methods of application. Instruction is given in proper school sanitation in both rural and urban areas. Interns attend a school board meeting. Financing and operating of school systems are studied. Relationships existing between health departments and school boards in achieving proper school sanitation are considered. Several schools are inspected and critical reports of sanitary conditions are made.

PROGRAM FOR SANITARY ENGINEERS, VETERINARIANS, AND SANITARIANS

The work of the sanitary engineer, the veterinarian, and sanitarian tend to overlap. However, the engineer's activities include primarily the technical planning, supervision, and administration of sanitary works. The sanitarian carries on the detailed field activities in environmental sanitation. The veterinarian is concerned chiefly with sanitary problems relating to milk and dairy products. Training courses are designed in such a way that the groups observe the same field activities but the individual projects carried out by each differ to some extent.



Class inspects dairy herd and dairy.

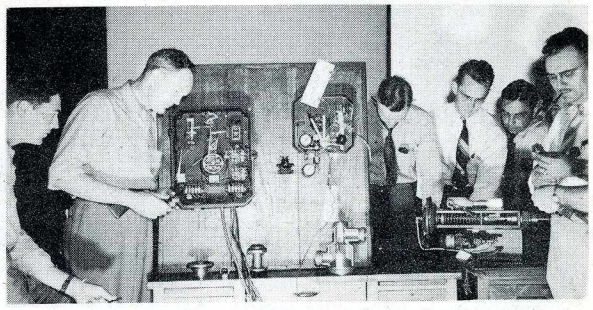


Sanitarian makes a dairy inspection.

Films, film strips, demonstrations, and reading materials provide background for evaluating conditions and procedures encountered in field work.

MILK SANITATION. Milk sanitation projects, demonstrations, film reviews, and lectures are developed for all groups.

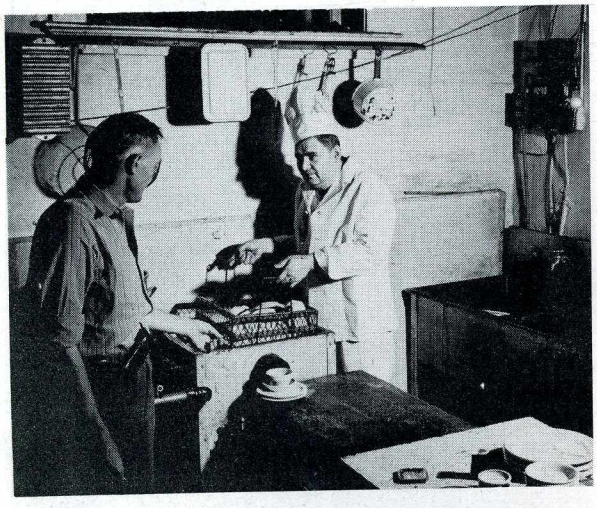
Inspecting pasteurization plant.



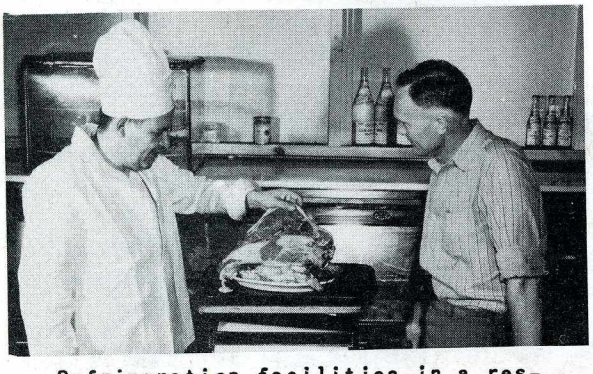
Class examines pasteurization controls.

Field inspections and reports are made of various establishments handling milk or milk products. These include dairy barns, pasteurization plants, ice cream establishments, and special freezing units. Inspections are made of dairy herds, laboratory tests are demonstrated, and recommendations are outlined for improvement of conditions. All records, including a U. S. Public Health Service Milk Sanitation States Survey, are prepared and evaluated.

SANITATION OF EATING AND DRINKING ESTABLISHMENTS. A general survey is made by each intern of the problems involved in retailing food products. A number of projects are carried on in connection with this work, and recommendations made for improving the general sanitary conditions found.



Inspection of dishwashing facilities in a restaurant.



Refrigeration facilities in a restaurant are discussed by intern inspector and owner.

A model freezing unit entirely enclosed in glass. Custard cups are delivered to customer through an opening at the bottom of the glass.

During inspection of establishments which handle food and drinks, interns are trained to visualize minute details of food and drink handling which may affect the health of the consumer. Projects are set up so that each trainee has a maximum of experience in coping with problems relating to eating and drinking establishments. Trainees receive supervised instruction concerning the work of inspections of restaurants and the administration problems arising as a result of these inspections. They participate in the conducting of food handlers' schools.

RURAL SANITATION. Each is assigned a rural area to evaluate, and in which to conduct a sanitary survey.

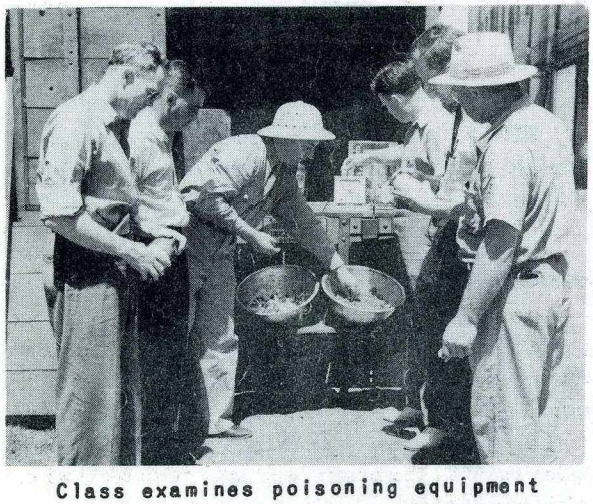
Projects are assigned which will provide trainees with a workable knowledge of design, installation, and cost of proper sewage disposal, and of private and semi-private water supplies. Methods of insect control are studied. Rural premise inspection procedures are demonstrated through actual contact with the problem.

MALARIA AND MOSQUITO CONTROL. Trainees participate in a practical program of malaria control in the training area. This includes drainage, larvicidal operations, and house spraying with DDT. Mosquito larvae and adults are collected and identified.

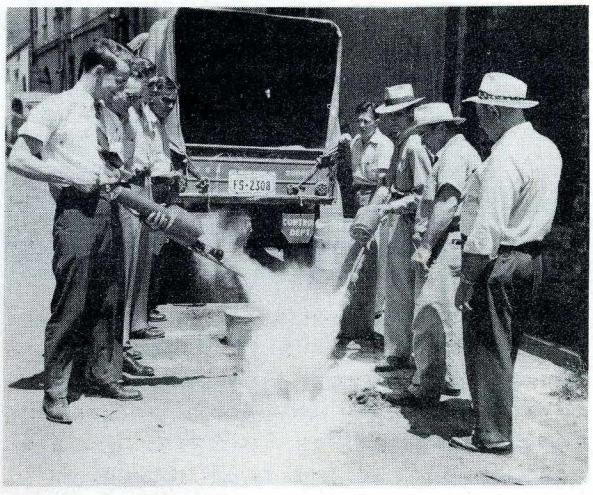
Dipping for mosquito larvae on the malaria control program.

RAT POISONING AND TYPHUS FEVER CONTROL. Trainees are assigned to an active rat-proofing program and to a rat poisoning program so they may observe latest procedures and technics which have been developed.

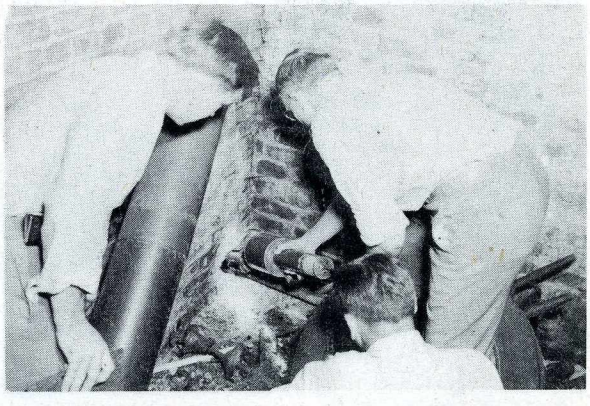
A survey is made of a section containing poor housing conditions and of a residential section having good housing to observe the general sanitary practices followed, and also to note the effectiveness of garbage and refuse collection and disposal in connection with typhus fever.



Class examines poisoning equipment used on typhus control program.



Dusting equipment used on a typhus control program being examined by class of sanitary engineers and sanitarians.



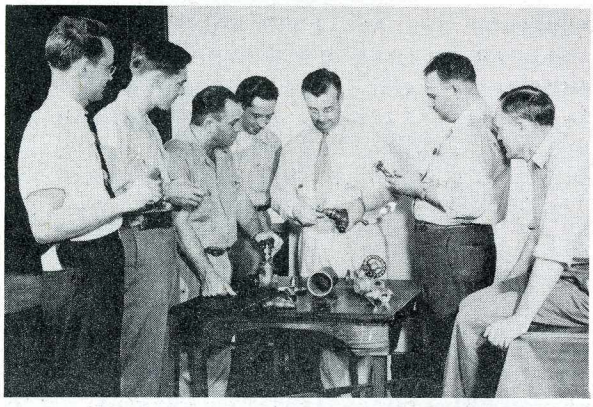
Dusting DDT into a rat hole.

SEWAGE DISPOSAL AND STREAM SANITATION. Each trainee observes the plans of sewerage systems and the sewage treatment works, and how they are developed and presented for approval to the Division of Sanitary Engineering, State Department of Public Health. A number of projects are set up for the interns to carry through in this unit.

INDUSTRIAL HYGIENE AND SANITATION. This unit acquaints the group with the general field of industrial sani-

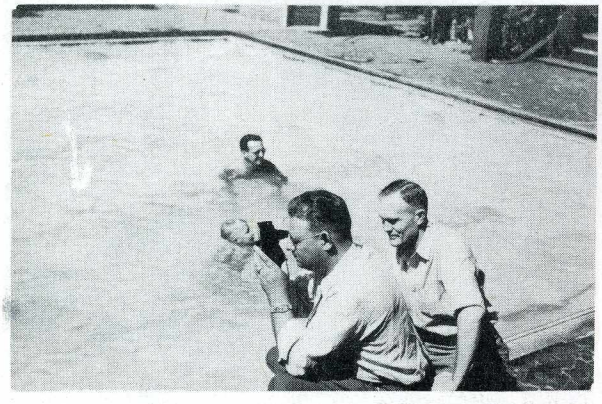
tation, its problems, methods of approach, and sources of assistance. They observe industrial plants in which adequate precautions have been taken to protect employees against hazards such as fumes, industrial gases, vapors, and dusts.

PUBLIC WATER SUPPLY. During this unit of work, trainees become acquainted with modern practices in the field of water purification. Each is given an opportunity to participate in the operation of both a large and a small water plant, to carry out essential chemical and bacteriological control tests, and to conduct independent investigations.



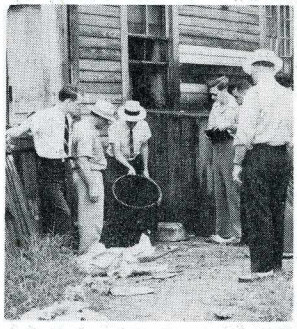
Interns inspect proper plumbing equipment and learn how it is used.

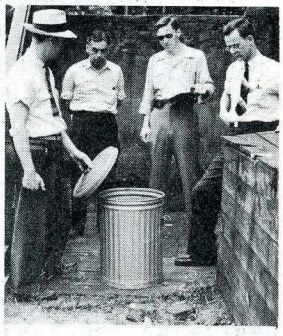
RECREATIONAL SANITATION. For this part of the work, interns investigate the recreational facilities of Savannah Beach and the public swimming pools. Special projects are set up and reports are made in connection with this work.



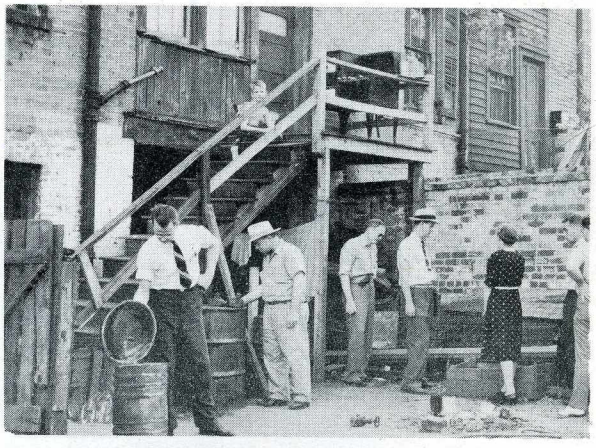
Inspection of water from pool for chlorine and sediment.

NUISANCE AND PREMISE SANITATION. Trainees answer complaints of sanitary conditions from citizens in the community. They discuss measures which need to be taken, then carry through follow-up measures to see that the source of the trouble has been removed or cleared up.

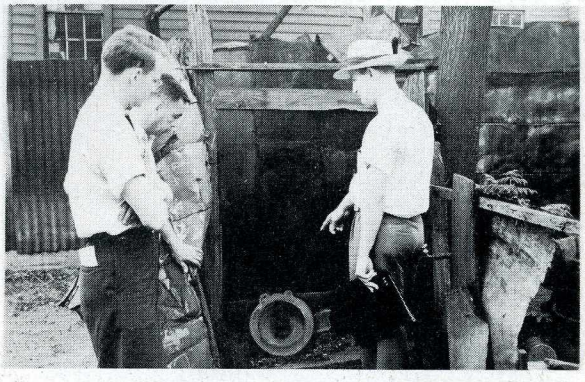




Trainees making premise inspections.



The purpose of premise inspection and clean-up program is explained to a tenant while the class notes technics and procedures used.



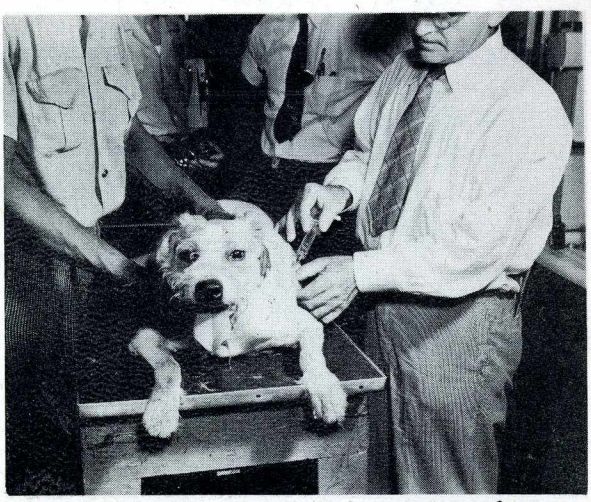
Inspection of privy in poor housing area.

Premise inspections are made of city blocks in widely separated sections of the city. Written reports indicate the condition of alleys, nuisances found, the disposal methods of trash, and the sewage and waste water disposal systems found at each dwelling.

FOOD HANDLERS' SCHOOL. As an example of specialized instruction in sanitation work, trainees take part in conducting a food handlers' school. Instruction is given by a staff of specialists for employees and proprietors of food handling establishments. Interns discuss the course and presentation and attend classes.

PUBLIC HEALTH NURSING FOR SANITARY ENGINEERS AND SANITARIANS. A series of lectures and demonstrations, together with clinic and home visit activities, give the trainees a better understanding of the purposes and scope of public health nursing. They work directly with the nurses in observing policies, activities, and sanitary conditions of homes visited.

RABIES CONTROL PROGRAM. At times it is necessary to carry on a rabies control program. Veterinarian trainees participate in the local rabies control program and assist in carrying through the activities associated with it.



Veterinarian immunizes dog for rabies as the class observes procedure.

ABATTOIR INSPECTIONS. Two weeks of the course are spent by each veterinarian trainee in a detailed study of problems related to abattoir inspection. Technics used as well as the physical facilities of the abattoirs are observed carefully. After a thorough study of the problems, the intern develops a course of study for the employees of the abattoir which should result in general improving of sanitary conditions.

EPIDEMIOLOGICAL STUDIES. The last part of the course designed for veterinarian trainees concerns the epidemiological features of disease. Several projects are assigned which relate to the prevalence of some diseases of animal origin. The location of its foci, establishing of the importance of this disease to the human population, methods, of control, estimation of the cost of the disease, and the cost of controlling are outlined by the intern.

PUBLIC HEALTH NURSING PROGRAM

After the generalized orientation period, the nurse trainees enter a field of specialized training. They perform the various duties involved in public

Class of intern nurses study nutrition.

health programs. In all the clinic and field work they are under the direction of competent supervisors.

NURSING VISITS. Each intern nurse is taught the accepted technics of home nursing visits. Each is given a series

Visiting nurses prepare for home calls.

of cases for clinic or home supervision. Cases are selected to illustrate as many different types of public health nursing activities as possible.

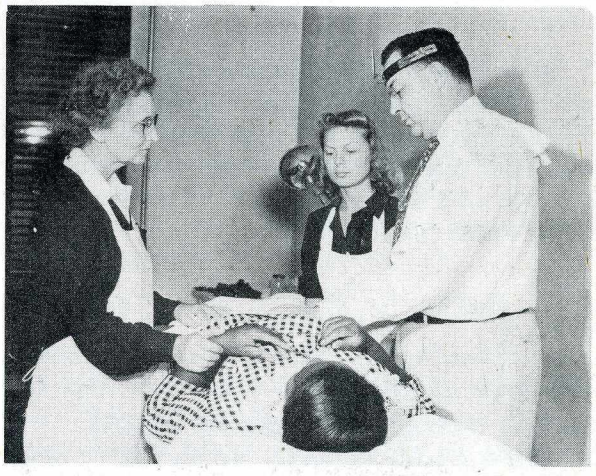
Intern nurses participate actively in the work carried on in the child health centers. These are stationed in various sections of the city, especially in the areas including housing projects. In addition to care and inspection given in the centers, the interns organize and instruct lay groups on problems in health education. Frequently they are called upon to present health

Care of an infant in child health center is demonstrated.

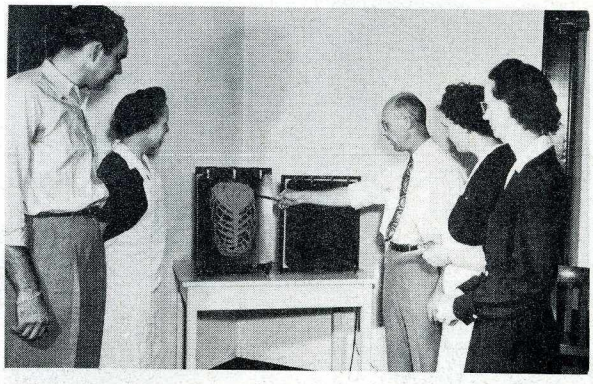
A visiting nurse immunizes a child while an intern nurse observes.

problems to various clubs, and to enlist their cooperation in stimulating civic action.

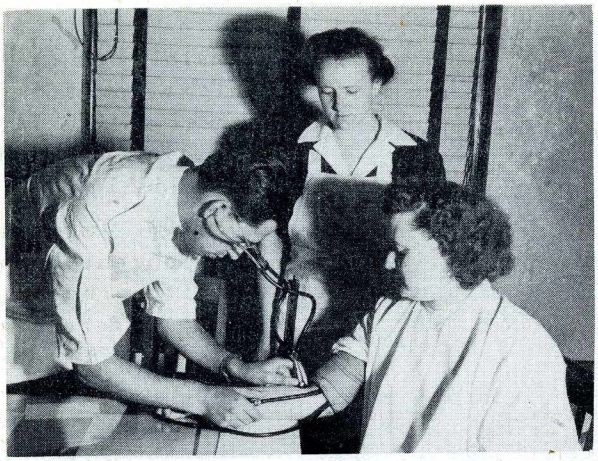
CLINIC ACTIVITY. In the various health clinics intern nurses study clinic organization and administration, and the



Examining a patient in the cancer clinic.



Physician explains an x-ray picture to patient, clinic nurse, and intern nurses.



An intern nurse observes the physician taking blood pressure of a patient from the prenatal clinic.

technics of clinic procedure. They attend the several types of communicable and non-communicable disease clinics and participate in their activities.

SCHOOL NURSING PROGRAM. School nurses are part of the regular nursing staff. The interns work closely with the regular nurses and the teachers in promoting and developing a sound health program in the schools.

PROGRAM FOR HEALTH EDUCATORS

Interns in this group usually have had post graduate college training in public health. The objective of the training is to provide field experience under supervision in an adequate health department.

Health educators plan a cooperative health project.

The course given to health educators is designed to outline methods and sources of materials. Since the students have done advanced work in public health, little attention is given to program content and organization of educational work.

Interns are instructed in methods of launching programs through contact with community leaders.

HEALTH EDUCATION MATERIALS. An annotated list is prepared of national, state, and local organizations from whom health education materials are available. This list serves as a guide in obtaining materials for future work. The importance of maintaining a library of materials is stressed. This is useful to other members of the staff.

PRESENTATION OF PUBLIC HEALTH INFORMATION. Interns are acquainted with the methods of disseminating information through preparation of materials and actual participation in the various health education programs in progress in the area.

Trainees are taught proper methods of preparing news articles. This is accomplished by conference with professional news writers, discussion of articles released currently, and by group criticism of articles prepared by individual trainees.

Interns observe in the clinic and field to obtain first-hand knowledge

Health educators prepare educational materials for lay groups.

of information which should be made available to the public. In conference with physicians and nurses, the points of information which should be conveyed and the manner of distribution is discussed. The trainees then outline the poster or pamphlet, which is edited and released.

Instruction is given as to repetition or continuous use of materials. An effort is made to outline programs of progressive materials which can be replaced.

ANNUAL REPORTS. The preparation of annual departmental reports is usually the function of the health educators. Specific instruction is given on content, composition, layout, and reproduction of annual reports.

Each trainee prepares a dummy copy of an annual report and solicits bids for reproducing by various methods from local printing concerns.

ORGANIZATION OF STUDY GROUPS. Interns receive instruction and experience in organizing study courses and conducting classes for lay and professional groups. Some of these courses are for in-service training, some general study courses, and others are directed to supply information to the public on some current health problem of wide interest. Some methods used are as follows:

(1) Organizing lay groups for study of general health problems.

(2) Actual participation in organizing a health study group in a selected area is conducted by each health educator. This project is continuous throughout the field training period.

(3) Through interviews, the trainee learns who are the key persons in the area where he is working. In conference with these leaders he determines their health problems, then proceeds to organize the study group directed to stimulate public interest in asking for remedial measures.

The trainee is responsible for providing suitable pamphlets, posters, motion pictures, and other materials, and for conducting the meeting to which the population of the area is invited.

SCHOOL HEALTH EDUCATION. Interns participate in the development of a well-rounded school health program. Trainees have individual conferences with teachers, administrators, PTA leaders, school nurses, and children to appraise the extent of public health knowledge, and to learn the present problems.

The health educator works toward the formation of a school health council in the school, develops teachers' kits of health materials by working with the teachers and nurses, and places selected materials in the school library.

DISSEMINATION OF LAY INFORMATION ON RABIES CONTROL PROGRAM. Trainees work in connection with the local health department staff in developing lay information material on rabies control, as representative of an intensive campaign against one problem. In this project emphasis is placed on the fact that health education is a joint function of the entire staff and not the sole responsibility of the health educator.

LIBRARY MATERIALS. Interns are instructed as to material to be placed in public libraries. Selected books are reviewed and discussed and surveys of libraries are made to determine adequacy of materials.

EVALUATION OF TECHNICS. During the training course for public health educators, each one is taught methods of evaluating objectively materials and technics of health education. Periodic evaluation permits selection of proper materials for problems of current importance.

(Continued on page 29)

HEADQUARTERS NOTES

CHANGE OF NAME FOR MCWA

Effective July 1, 1946, the organization known as the Malaria Control in War Areas becomes the Communicable Disease Center. The next issue of the Field Bulletin will carry a detailed account of the policies, plans, and purposes of the Communicable Disease Center.

HOLLIS, HENDERSON, AND MILLER TO PUERTO RICO

Sanitary Engineer Director Mark D. Hollis, Sr. Sanitary Engineer (R) John M. Henderson, and Surgeon Seward E. Millerewere in Puerto Rico recently to confer with authorities on several problems regarding the MCWA program on the island. These included: (1) determining the policy governing the military base malaria control program for the year 1946-47; (2) devising with the Directors of the School of Tropical Medicine cooperative arrangements for the collection and preparation of tropical disease specimens for teaching use in continental United States; and (3) developing a continuing plan of participation in extended malaria control operations with the Insular Health Department.

While on the trip, Colonel Hollis and Colonel Henderson inspected the anti-malaria activities being carried on at several locations. They reported impressive progress in drainage operations on the Extended Malaria Control Program.

The incidence of malaria among military forces stationed in Puerto Rico during 1942 was of such intensity as to cause serious concern. By 1943, antimalarial measures were successful in achieving a 95 percent reduction of malaria morbidity. This reduction has been maintained in subsequent years. This is one concrete example of the high efficiency which MCWA practices achieved. Frequently it is not possible to measure the degree of success of a malaria control program, but statistics for this particular area showed this high percentage of malaria control.

A preliminary understanding was reached concerning possible additional Communicable Disease Center activities on the island during the fiscal year 1947, and adjustments of personnel were made. Agreement on Atlanta-District relationships was reached.

Dr. Miller investigated the work being done in connection with the collecting of materials for laboratory use in the Parasitological Section of the Laboratory Division. In addition, he observed the progress being made on the series of films and film strips on tropical diseases.

The three men from Headquarters spent some time in St. Thomas on the Virgin Islands conferring with the Governor of the islands and the Commissioner of Health, Dr. Knut-Hanson, on mosquito-borne disease problems.

TEXAS PUBLIC HEALTH ASSOCIATION MEETING

The twenty-first annual conference of the Texas Public Health Association was held at Austin, Texas, during May. At this meeting Sr. Scientist (R) Justin M. Andrews presented a paper entitled, "Public Health Service Communicable Disease Center."

At the same conference S. A. San. Engr. John Wiley gave a talk on "The Control of Typhus and other Rodent-Borne Diseases." He illustrated the speech with slides.

PLANS FOR PLAGUE CONTROL

During May San. Engr. Director M. D. Hollis conferred with Dr. J. W. Mountin and Dr. N. E. Wayson at Salt Lake City, Utah, on Sylvatic Plague Control. Plans were discussed which included integrating typhus control with plague control where the two fall within the same boundaries.

While in Salt Lake City, Colonel Hollis discussed malaria control measures pertaining to the Ninth Service Command with the Surgeon from the Ninth Service Command.

VISITORS TO HEADQUARTERS IN ATLANTA

The U. S. Public Health Service and the Georgia State Department of Public Health have cooperated in providing practical training facilities in the fields of malaria and typhus control, public health administration, and rural sanitation for a large number of foreign visitors.

During June a number of medical men and engineers who have been studying in various universities throughout the United States in the past year visited the Training Division of the Communicable Disease Center at Atlanta. Those who came under the auspices of the Institute of Inter-American Affairs were:

Dr. Edgar Braga, Head of the Health Services of the Eighth District, Rio de Janeiro, Brazil.

Dr. Fernanda Bustamente, Malariologist from the National Malaria Services, Brazil.

Mr. Hugo Kunhardt, malaria control engineer from the Dominican Republic.

Mr. Carlos L. Philipovsky, who is in charge of the Topographic Section of the Institute of Inter-American Affairs Cooperative Services in Brazil.

Mr. Guillermo A. Varas, who will work with the Department of Public Health of Ecuador designing and constructing sanitary engineering projects.

Mr. Demetrio C. Ganan, Engineering Sub-Director of the Malaria Division of the Public Health Department in the Dominican Republic.

Dr. Antonio Alvarez, Medical Assistant in the National Department of Health, Quito, Ecuador.

Visitors from the Rockefeller Foundation were:

Dr. Hugh Leavell of the Division of Medical Science of Rockefeller Foundation visited the U. S. Public Health Service, Malaria Control in War Areas Headquarters in Atlanta recently. He was accompained by Dr. Robert Morrison of the same Division. Dr. Leavell is especially interested in improving preventive medicine instruction in medical schools. He was in Atlanta to aquaint himself with the activities of the Training Division and the Production Division.

Dr. Gerald Schipper, from Holland.

Dr. John C. Sphangos, Malariologist, Chief Assistant with the Malaria Division of the Athens School of Hygiene, Athens, Greece.

A visitor from UNRRA was Dr. P. Kapalos, a Greek physician sent to this country as an UNRRA fellow.

Dr. G. Robert Coatney, Division of Physiology, National Institute of Health, was a visitor to Headquarters recently. He was completing NIH investigations on the Federal Prison Project in Atlanta. This project is to be transferred to the Federal Correctional Institute at Seagoville, Texas.

Laurence Trotti, Assistant State Director of Malaria and Typhus Control in Texas, visited Headquarters recently to consult with officials on the problems of control of these two diseases in Texas.

Sanitarian (R) Eli Abbott, Jr., District No. 4 Malaria Control Engineer, was a visitor to Headquarters recently to consult with engineers about the activities of District 4.

S. A. Engineer (R) James Church from Nashville, Tennessee, was in Headquarters offices for a conference on malaria control and typhus activities in Tennessee.

George Keener, Assistant Entomologist from the Health and Safety Department of T.V.A. at Wilson Dam, Alabama, spent the latter part of April and first part of May at Headquarters office.

Dr. J. K. Bhattacharya of India spent two days in the In-Service Training Section during June, observing training methods used. He is Director of Training at the Bengal Public Health Department, Sungur Health Center, India.

Dr. H. I. Paik, from the Bureau of Public Health in Korea, reported to the In-Service Training Section in June for a four-week training course in malaria and typhus control. He came to Atlanta under the auspices of the Rockefeller Foundation.

Henry Merubia, entomologist from Cochambe, Bolivia, reported to the In-Service Training Section June 24, for a two-months training course in entomology and insect control activities. Mr. Merubia was sent to Atlanta for training by the Rockefeller Foundation. Upon his return to Bolivia, Mr. Merubia will be in charge of malaria control activities in that country.

CONFERENCE IN ARKANSAS

Sr. Scientist (R) Justin M. Andrews attended the annual conference of the Arkansas State Board of Health at Little Rock, Arkansas, during the latter part of May. At this meeting Dr. Andrews presented a paper summarizing the functions of the U. S. Public Health Service Communicable Disease Center in Atlanta.

PERSONNEL CHANGES AND ASSIGNMENTS

Dr. Justin M. Andrews was released recently by the Army of the United States to accept a commission with the United States Public Health Service as Senior Scientist (R) and the position of Deputy Officer in Charge of the Communicable Disease Center in Atlanta. Dr. Andrews was a colonel in the Sanitary Corps and served as Theater Malariologist in the Mediterranean and Pacific areas. Prior to his service with the Army, Dr. Andrews was Director of the Division of Malaria and Hookworm Service with the Georgia Department of Public Health. Before coming to Georgia, he was Associate Professor of Protozoology at Johns Hopkins School of Hygiene and Public Health.

Dr. Griffith E. Quinby, from Johns Hopkins School of Hygiene and Public Health, has been assigned to the Neurotropic Virus Insect Control Project with headquarters at Montgomery, Alabama. Methods and techniques of insect control developed in this laboratory will be tested in areas where there are outbreaks of polio. Prior to his entrance to medical school, Dr. Quinby was an entomologist with T. V. A. at Wilson Dam.

S. A. Sanitarian (R) Paul P. Weinstein of the Parasitological Section of the Laboratory Division in Headquarters, Atlanta, was assigned recently to the School of Tropical Medicine in San Juan, Puerto Rico. He is securing parasitological material for use in courses in Laboratory Diagnosis of Parasitic Diseases, offered by the Laboratory Division in Atlanta, and for distribution to the state and local health laboratories as an extension service of the Laboratory. In addition, he is obtaining photographic material in connection with the production of film strips and motion pictures of a parasitological nature for the Audio-Visual Production Division.

Arthur J. Levin, Information Specialist, reported for duty to Headquarters in Atlanta and was assigned to the Reports Section of the Training Division. Mr. Levin was formerly Information Specialist with the Army Air Forces. Prior to that, he was research assistant at the University of Iowa in the Departments of Zoology and Radiology.

S. A. San. (R) Joseph O'Brien reported to the Training Division on May 24. He had been with UNRRA in Greece. He will have charge of the development of training facilities in sanitary engineering, working in cooperation with the Columbus-Muscogee County Department of Health

Basil Marcos, recently returned from the Army, spent a short time in the In-Service Training Section on mosquito identification, before leaving for an assignment with a mobile unit in California.

Dr. Alan W. Donaldson was commissioned recently as Sr. Asst. Scientist (R) and has been assigned to the Parasitology Section of the Laboratory Division at Headquarters, where he will assist with training courses in the laboratory diagnosis of parasites. Dr. Donaldson received his Sc. D. at Johns Hopkins School of Hygiene and Public Health and was with an Army Malaria Survey Detachment in the Southwest Pacific Theater prior to his appointment with the U. S. Public Health Center.

Asst. San. (R) George Roy Hayes, Jr., who was on MCWA duty in Louisiana, was assigned to MCWA work in Jamaica, British West Indies.

San. (R) T. E. McNeel has been assigned to temporary duty in Atlanta with the Epidemiology Division on fly control activities in connection with polio investigations.

S. A. San. (R) George A. Thompson, Jr., has been transferred from Jamaica to Puerto Rico on malaria control.

S. A. San. (R) Harry B. Pratt transferred from San Juan, Puerto Rico, to the Laboratory Division at Headquarters in Atlanta.

S. A. San. (R) David D. Bonnet, who was in charge of dengue fever control in Honolulu, was in Atlanta for a conference concerning his future assignment.

S. A. San. (R) Oscar L. Cartwright transferred from Columbia, South Carolina, to Nashville, Tennessee, to replace S. A. San. (R) Arthur Schlaifer, who resigned to go to school in Pennsylvania.

S. A. San. (R) D. C. Thurman transferred from the Entomology Division at Headquarters office in Atlanta to Jacksonville, Florida, to replace S. A. San. (R) Maurice Provost, who is returning to Iowa State College, Ames Iowa.

San. (R) William Frohne has been assigned recently to duties at Manning, South Carolina, where he will conduct field studies in malaria. He will replace S. A. San. (R) C. W. Sabrosky, who resigned to accept a position as entomologist in the Division of Insect Identification at the U. S. National Museum in Washington, D. C.

Asst. Entomologist H. Rodney Dodge, formerly State MCWA Entomologist with Georgia, has been assigned to the Virus Laboratory in Montgomery, Alabama, where he will participate in field investigations on polio.

Sr. San. Engr. (R) John M. Henderson visited the U. S. Department of Agriculture Laboratory at Orlando, Florida, recently. He was released from active duty with the Public Health Service on June 30 to assume his professorial duties with Columbia University.

Typhus Control Aide James McClay has returned from military service and been sent to the State Board of Health of Florida to work on the typhus control program.

San. Harry C. Essex, while assigned to temporary duty on the typhus control program at Norfolk, Virginia, inaugurated dusting operations and assisted with the ratproofing program which is to be conducted by the pest control operators of the city.

S. A. San. (R) George Gehres has been assigned to the Interneship Training Program in Savannah, Georgia. Capt. Gehres returned recently from Greece, where he was with UNRRA.

San. Allen D. Mayfield returned from military service recently and was assigned to Arkansas on the malaria control program of that state.

Engineering Aide Charles Darnell spent two weeks at Headquarters taking the typhus control course before returning to Knoxville to become supervisor of the Knoxville dusting program. Mr. Darnell replaces Sanitarian M. H. Cooper, who died recently. Formerly, Mr. Darnell was with the malaria control program in Knoxville.

S. A. San. Engr. (R) Donald J. Schliessman was transferred from typhus

control activities in Orange, Texas, to Austin, Texas, where he is assistant to Sanitarian L. J. Trotti, Assistant State MCWA Director.

S. A. Engr. (R) Aubrey L. Willard was transferred from malaria control activities in Houston, Texas, to Livingston, Texas.

Jr. Asst. Engr. (R) Orville L. Meyer has been transferred from typhus control in Albany, Georgia, to Macon, Georgia.

Asst. Engr. (R) Lewis D. Anderson transferred from typhus control in Charlotte, N. C., to Dunn, N. C.

Asst. Engr. George L. Jacobson was transferred from the MCWA program in Marysville, California, to San Rafel.

Asst. San. Engr. (R) Sidney Richter returned recently from the Army and is assigned to the Carter Memorial Laboratory at Savannah, Georgia. During the war he was in Chemical Warfare, working with the chemical treatment of clothing. Before entering the Army, Mr. Richter was stationed at Myrtle Beach, South Carolina.

San. Engr. (R) Earlie Buren Needham, District Supervisor of malaria control in Arkansas, was transferred to the Pan-American Sanitary Bureau in El Paso, Texas, in June.

San. Engr. (R) Paul Henderson, U.S. Public Health Service, District No. 8 Liaison Officer, transferred to the Federal Public Housing Administration in Seattle, Washington.

S. A. San. Engr. (R) John G. Ault returned from UNRRA in Italy and was assigned to Monticello, Florida, as District Supervisor of the malaria control program. Before entering the Army, Mr. Ault was with MCWA in Kentucky.

Asst. Engr. (R) Byron W. Candage was transferred from the typhus control program at Shreveport, Louisiana, to Hammond, Louisiana.

S. A. San. (R) Robert Samuels transferred from the malaria control project at Montgomery, Alabama, to an impounded water survey project in Nevada, Missouri.

Jr. Asst. San. (R) Mixan Bankston transferred from malaria control activities at Dry Prong, Texas, to Monroe, Louisiana.

S. A. Engr. (R) Joseph H. Coffey was transferred from the Extended Malaria Control Program in Florida, where he was in charge of field operations, to the Epidemiology Division where he will be operations supervisor of the Insect-Polio Investigations, with headquarters at Montgomery, Alabama.

Sanitarian George Stocking, recently returned from the Army, will be stationed with the Epidemiology Division on the Insect-Polio Investigation Program.

Medical Director C. R. Eskey has been transferred from Headquarters to the Quarantine Station, San Diego, California, where he is Chief Quarantine Officer.

San. Engr. (R) Richard L. Woodward of the Engineering Division, stationed at Washington, D. C., has been transferred to Cincinnati, Ohio, to work with the Water and Sanitation Station.

S. A. San. (R) Ralph C. Barnes received his appointment April 10, to the In-Service Training Section of the Training Division at Headquarters. Capt. Barnes transferred from District 1, New York City, where he was District MCWA Entomologist.

Dr. Stanley Freeborn has accepted a consultant position with MCWA for the coming summer. Dr. Freeborn, formerly with MCWA in Atlanta, is Assistant Director of the Experiment Station, University of California, at Berkeley.

S. A. Surgeon Robert H. English transferred from the Interneship Section at Atlanta to the Marine Hospital, Baltimore, Maryland.

Asst. San. (R) Thomas W. Haines was recalled to active duty at Augusta, Georgia, where he had been attending medical school, for summer duty on the Malaria Investigations Project at Manning, S. C.

S. A. San. (R) Robert B. Carson, formerly assigned to the Georgia State Health Department, was transferred to Savannah on the Interneship Program.

Joseph T. McGrath, formerly with the Army Pictorial Service in Europe dur-

ing the war, has been assigned as Film Librarian at Headquarters.

S. A. San. (R) Charles F. Gerlach, State MCWA Entomologist for Illinois, was released from duty recently to accept a position as entomologist with a Michigan chemical company.

S. A. San. Engr. (R) Charles I. Mansur, editor of the Impounded Water Manual, a cooperative project of TVA and USPHS, has been released from duty to resume his former position with the U. S. Engineers. Mr. Mansur will be stationed at the U. S. Engineers Office at Vicksburg, Mississippi.

Jr. Asst. San. (R) Lewis R. Joncich, stationed at Carter Memorial Laboratory at Savannah, has been released from duty to accept a position with a commercial chemical company in California.

Asst. Engr. (R) Robert J. Caruso was released from duty on the Extended Malaria Control Program in Arkansas to accept a position in private industry.

Asst. Engr. (R) James W. Cunningham, on duty in Montgomery, Alabama, resigned to take charge of his home farm in Florence, Alabama.

S. A. San. (R) L. Clark Peckham was released from duty on the Interneship Training Program at Savannah, Georgia, to return to his home in Wisconsin.

Asst. Engr. (R) Michael Gold was released from the Extended Malaria Control Program in Georgia to accept a position in the field of industrial engineering.

Asst. Engr. (R) Kenneth E. Hanus, formerly with the *Aedes aegypti* Control Program in Charleston, was released from duty to accept employment with the Milwaukee, Wisconsin, City Health Department.

S. A. San. (R) William E. Bickley, State MCWA Entomologist in Virginia, has resigned to accept a position with the medical school at the University of Richmond, Virginia.

Asst. San. (R) Stephen P. Hatchett, assigned to the *Aedes aegypti* Control Program in Galveston, Texas, was released to accept a biology teaching position at Presbyterian College, Clinton, S.C.

S. A. San. (R) John M. Ellis, formerly Chief of the Records and Statistics Section at Headquarters, has been released from duty to accept a position as Associate Professor of Zoology at Alabama Polytechnic Institute at Auburn, Alabama.

San. (R) Robert L. Usinger, formerly Chief of the Editorial Section at Headquarters, has been released from duty to return to his former position as Assistant Professor of Entomology at the University of California at Berkeley. Dr. Usinger is Assistant Entomologist at the Experimental Station and is in charge of the insect collection of the University.

Surgeon (R) William S. Boyd resigned from the Service recently and has returned to his former position at the University Hospital in Augusta, Georgia.

Asst. San. (R) George E. Washburn, State MCWA Emtomologist in California, was released to become superintendent of the Terlock Mosquito Abatement District in California.

Asst. San. Engr. (R) W. J. Buchanan, formerly with the Extended Malaria Control Program in Greenville, Miss., was released to accept a position with TVA.

Asst. Engr. (R) Norman Sageman, formerly on the North Carolina Extended Malaria Control Program, was released to return to private industry.

Jr. Asst. San. (R) Dorothy G. Fawcett was released from duty with the Virus Laboratory at Montgomery, Alabama.

S. A. Engr. (R) William C. Murray has been released from the Impounded Water Section at Headquarters to return to work with the U. S. Engineers.

Asst. San. (R) Glen C. Prock, on duty with the *Aedes aegypti* Control Program in Louisiana, was released from duty recently. He plans to organize an exterminating company.

Jr. Asst. Engr. (R) Vincent J. Roggeveen was released from duty on the Jonesboro, Arkansas, malaria control program. He returned to his home in New York City.

Asst. San. (R) Robert G. Rosensteil, on duty with MCWA in California, was released to return to the Oregon State College Experimental Station.

Asst. Engr. (R) Edward G. Shields was released from duty with the Extended Malaria Control Program in Arkansas to accept a position in private industry.

Asst Engr. (R) Robert L. Stenburg was released from duty at Carter Memorial Laboratory to return to his former position with the Utah Copper Company.

Asst. Engr. (R) Domian Rodriquez Trias, formerly on duty with MCWA in Puerto Rico, was released from active duty, effective May 15.

Jr. Asst. Engr. (R) Edward R. Smith, on duty with the Extended Malaria Control Program in Arkansas, was released to accept a position in private industry.

S. A. San. Engr. (R) Arve H. Dahl was released from the Interneship Program in Savannah, Georgia, to accept a position with the California State Health Department on mosquito control.

S. A. Surgeon Otis W. Yeager was released from duty in the Division of Epidemiology at Headquarters to return to private practice in Birmingham, Alabama.

S. A. San. (R) Newell E. Good, MCWA entomologist for the District of Columbia, was assigned to UNRRA for insect-vector investigation and control in China.

Jr. Asst. Engr. (R) Irvin R. Holmes was released from duty with the DDT residual spray program in Gainesville, Florida, to accept a position with an engineering firm.

EPIDEMIOLOGY DIVISION

CHANGE OF NAME FOR MEDICAL DIVISION. The name of the Medical Division has been changed to Epidemiology Division. This change became effective May 22.

SURVEY OF MALARIA MADE IN SOUTH CAROLINA. Results have been compiled of the 106,595 thick blood smears made in the county-wide surveys in South Carolina during the 1937-1943 period. These surveys were made to determine the foci of malaria infection in the state. Smears were made from blood of elementary school children. Results of this survey will be made available.

ADDITIONAL COUNTIES FOR TYPHUS CONTROL. The following list includes additional counties in the Southeastern states which meet epidemiological requirements for typhus control operations. These counties have reported 10 or more cases of typhus fever during the calendar year 1945 and are not included in the present list of 140 counties in which typhus control is being done. GEORGIA: Berien, Hall, Lowndes, Walton, and Washington. LOUISIANA: Avoyelles, Caddo, East Carroll, Iberia, Lafourche, Vermilion, and Washington. MISSISSIPPI: Jackson and Lauderdale. SOUTH CAROLINA: Anderson, Dorchester, and Jasper. TEXAS: Angelina, Bell, Brazoria, Colorado, Duval, Fort Bend, Grimes, Hardin, Tom Green, and Willacy.

LABORATORY DIVISION

EXTENSION ACTIVITIES OF DIVISION OF LABORATORY SERVICES. During each month of the past year, the Diagnostic and Training Laboratory of the United States Public Health Service, Atlanta, Georgia, has sent out two blood slides to each of more than 150 participating state and local public health laboratories. This has been done in connection with the Extension Service in the diagnosis of malaria parasites. These slides have been accompained by keys so that the technicians can check their own results.

Recently the Diagnostic and Training Laboratory has undertaken the distribution of unknown specimens of the intestinal parasites as a service extended to students who have attended one of the courses in Laboratory Diagnosis of Parasitic Diseases. Within the near future this service will be available also to all public health laboratories who request it.

SIX-WEEK COURSE OFFERED. On July 8 another six-weeks course in the Labtory Diagnosis of Parasitic Diseases will begin at Atlanta, Georgia. This course is designed to give specialized

laboratory training to personnel from state and local health departments and the United States Public Health Service.

POLIO MEETING IN ALABAMA. Surgeon Seward Miller and Sr. Scientist (R) Justin M. Andrews attended a meeting in Birmingham, Alabama, during June on poliomyelitis preparedness. The meeting was attended by both lay and professional persons who are pooling resources against outbreaks of the disease. The two men from Headquarters spoke to the approximately 400 persons attending about the investigations which are being conducted on flies in connection with poliomyelitis control.

ENTOMOLOGY DIVISION

WATER HYACINTH INVESTIGATIONS. The U. S. Engineers Department has been holding a series of public hearings in connection with the survey of water hyacinth problem in the Southern states. Hearings were conducted in Tavares, Dade City, and Sebring, Florida, on June 11, 12, and 13. Representatives of the United States Public Health Service, United States Fish and Wildlife Service, United States Department of Agriculture, and the United States Engineers had a part in the hearings. The office of MCWA was represented by a member of the Entomology Division.

Interested persons from various areas where the hyacinths are a problem in streams and rivers came before the group. They gave their opinions, ideas, and recommendations on the hyacinth nuisance as related to water supplies, recreation, navigability of streams, mosquito breeding, and stream pollution which they feel should be taken care of.

Transcripts of the hearings, together with reports of investigations on possible methods of eradication are to be used by the United States Engineers in presenting to Congress recommendations for handling the hyacinth problem.

DYSENTERY CONTROL IN PHARR, TEXAS. A report of laboratory investigations of the Dysentery Control Project in Pharr, Texas, indicates that diarrheal-producing organisms are nearly four times more prevalent in areas without fly control than in areas treated with DDT.

Fly counts, based mainly on grid determinations, show consistent though variable reductions in treated towns. It appears that effectiveness of fly control varies directly with the area and population of the treated municipality. Fly densities of the same species differ inside and outside of houses.

FLORIDA ANTI-MOSQUITO ASSOCIATION MEETING. The Florida Anti-Mosquito Association held its seventeenth annual meeting at West Palm Beach, April 28-May 1. Sr. Entomologist (R) G. H. Bradley from the Entomology Division, Atlanta Headquarters office, presented the paper, "Mosquito Control Operations of MCWA in the Southeast." Sanitarian (R) T. E. McNeel, District 4 Entomologist, led a discussion on the subject, "The Problems of the Entomologist in Malaria Control."

IN-SERVICE TRAINING SECTION OF THE TRAINING DIVISION

TYPHUS CONTROL SUPERVISORS MEET IN TEXAS AND LOUISIANA. Upon request of the states, meetings were conducted by the In-Service Training Section of the Training Division at Waco, Texas, and at Alexandria, Louisiana. June 24-28 to demonstrate to the state and area supervisors new equipment and latest methods of dusting used on typhus control programs. S. A. San. Engr. (R) R.J. Hammerstrom was in charge of the meeting. Assisting him were Engineering Aide Luther Standifer of the Atlanta Typhus Control Project , S. A. San. (R) A. Earl Pritchard of the Engineering Division, and S. A. San. Engr. James G. Terrill, Jr., of the Training Division.

In addition to lectures and demonstrations on the use of DDT residual dust and 1080 poison, several film strips were shown which depicted methods of dusting, evaluation of DDT dusting, and the use of 1080 poison. Records and re-

ports used by the men in sending in information concerning evaluation procedures were discussed thoroughly, since it is desirable to have reports prepared in a uniform manner from all the areas to facilitate coding and tabulation of results at Headquarters.

Nearly 60 attended the meeting in Texas, and 25 attended in Louisiana.

U. S. ARMY ENGINEERS TRAINING COURSE. The three-week training course for U. S. Army Engineers started in Atlanta April 29. All sections of the United States were represented by the 38 engineers who came from 23 states and the District of Columbia.

The first week of training was conducted in Atlanta by personnel from the In-Service Training Section of the Training Division. They were assisted by members of the Impounded Water Section of the Engineering Division.

The last two weeks were spent in field activities on T. V. A. impoundments in Tennessee and Alabama, conducted by T.V.A.

MALARIA TRAINING COURSE FOR LATIN-AMERICAN GROUP. The In-Service Training Section conducted a course in malaria training for personnel from Latin-American countries from June 13 through June 25. The group consisted of medical men and engineers sent to Headquarters by the Institute of Inter-American Affairs and UNRRA.

After preliminary training in Atlanta, the class went to Savannah for further field training in malaria. Later they spent two days in field activities at the Emory Field Station and Dougherty County.

GENERAL ORIENTATION COURSE GIVEN. The In-Service Training Section conducted a general orientation course for Headquarters personnel June 3-7. The organization of the Headquarters office was explained to the group. Special emphasis was given to routine administrative procedures followed in all the offices. Twenty attended the course.

ARRANGEMENTS MADE FOR FIELD TRAINING AREA. Arrangements have been made to use the Emory Field Station and Dougherty County as a field training area for In-Service Training Courses in malaria control.

PERSONNEL SECTION (CIVIL SERVICE)

PERSONNEL CARDS CODED. The Personnel Section announces that cards have been made out for all personnel on MCWA. These cards have been coded and include data concerning each individual with MCWA. In-grade promotions are figured at least two weeks ahead of time so that when a promotion is due the individual receives it without delay. However, an efficiency rating must be filled out before the person receives his promotion. The Personnel Section wishes that each one who believes he is due an in-grade promotion will check this matter with his State Administrative Assistant, who, in turn, will contact Headquarters in Atlanta to check further on the situation.

CLASSIFICATION SHEETS SET UP. Classification sheets have been set up describing each of the MCWA positions in the various states, together with the qualifications necessary for those who are holding these positions or who wish to apply for vacancies. As vacancies occur, the written job sheet is used as a basis for determining whether or not applicants qualify for the position. This eliminates delays and unnecessary correspondence concerning the filling of positions. Under the old system, as new personnel are needed to carry on the activities for which there are no job descriptions, the work must be evaluated and a description of qualifications made out.

BUDGET AND FISCAL BRANCH

REVIEW OF VOUCHERS AND PAYROLLS. A recent survey of vouchers submitted for payment to the Budget and Fiscal Branch shows that this branch receives a monthly average of 1,610 miscellaneous vouchers, 560 travel vouchers, and 225 payrolls; a total of 2,395. In addition, approximately 1,500 encumbering documents are received and processed each month.

Because of revised methods for processing documents and the new internal routine procedure, the Budget and Fiscal Branch now processes miscellaneous and travel vouchers within 48 hours after they are received in the branch. The vouchers are then transmitted to the Washington Audit Unit for further examination and for scheduling to the Disbursing Officer.

The Payroll Section of the Budget and Fiscal Branch has established procedure for processing payrolls within 24 hours after they are received. They are then transmitted to the Disbursing Officer for payment. This enables the Disbursing Officer to issue checks in time for delivery to employees on a definite scheduled date.

Effective July 1, the Accounts Section of the Budget and Fiscal Branch will inaugurate the use of revised procedure which will make a detailed budgetary control of funds possible. This procedure will enable the Headquarters office to furnish local offices with information as to expenditures and obligations incurred by the local office as of the end of each month. Local officers will receive a listing of all outstanding obligations against that office each month.

PRODUCTION DIVISION

FILM RELEASES. The four 16 mm., black-and-white, sound films described below were made in cooperation with T. V. A. They will be released in color in the early part of September. These films are documentary in nature, depicting problems involved in planning and constructing the 185-mile-long Kentucky Reservoir with its 2,000 miles of shoreline.

T.V.A. PLANNING. This film describes measures which were followed in determining malaria hazards prior to reservoir construction. These include preliminary investigations by the medical malariaologist, biologist, and engineer in: (1) determining malaria potentialities by surveying the past morbidity and mortality records of malaria and by conducting blood surveys one mile from the proposed location of the dam to establish the extent of the malaria already present; (2) locating the likely breeding places of *Anopheles quadrimaculatus;* (3) examining adult mosquito catching stations to determine the index of mosquito breeding; and (4) conducting surveys to locate places where impoundments will be created. After a complete investigation, appropriate control measures were selected. Running time of the film is 20 minutes. Production number is MCWA-TE-4-004.0.

T. V. A. RESERVOIR PREPARATION. Second film of the documentary films in the series shows the preparations made and the work done in clearing and cleaning the reservoir before water was admitted. The preparatory measures included: (1) clearing and removing of trees and underbrush; (2) use of special bank machines to prepare a clean water line not suitable for *Anopheles quadrimaculatus* breeding; (3) drainage of swamp areas; (4) use of dynamite for removing stumps in woodland areas; and (5) the use of arboricidals to prevent certain plants from growing. It shows how the channels were marked out and ditches staked and constructed by means of draglines. All precautions were taken to prepare as clean a basin as possible before it was filled. Running time of film is 15 minutes. Production number is MCWA-TE-4-005.0.

T. V. A. PERMANENT IMPROVEMENT. This film shows provisions made for permanent malaria control measures in the Kentucky Reservoir. These include: (1) diking and dewatering of areas; (2) deepening and filling in of flat, marginal sections; (3) restricting the use of land to daylight hours when *Anopheles quadrimaculatus* mosquitoes are not active; (4) creation of new slopes for the shoreline to prevent erosion; and (5) patch sodding, also for the prevention of erosion. Cost of permanent control measures is discussed. Running time is 15 minutes. Production number is MCWA-TE-4-002.0.

T. V. A. EMERGENCY MEASURES. The fourth film of the series shows stages in construction of the Kentucky Reservoir. Impoundments created by the reservoir in 1944 necessitated the instigation of some emergency measures to care for the immediate mosquito problem. These included: (1) mosquito proofing; (2) spraying insecticides inside the homes; (3) application of certain larvicidal measures; and (4) a planned educational program, including the instigation of workshops with training facilities for large groups. The film shows how spot maps were made to show the location of all homes within a mile range of the reservoir. It shows, too, how owners were contacted and plans made and executed to mosquito-proof the houses within the area, and how pyrethrum was used as an insecticide for spraying the homes. Running time of film is 20 minutes. Production number is MCWA-TE-4-003.0.

DDT AS A MOSQUITO LARVICIDE. This is a black-and-white film strip depicting the newest developments and uses of DDT as a larvicide. Latest types of equipment are demonstrated, and proper uses are shown. Running time is 13 minutes. Production number is MCWA-TE-5-074.0.

POLE DRAINAGE. This is a 16 mm., documentary sound film in color, made in cooperation with the Tennessee Department of Public Health. A method of sub-surface drainage of seepage areas created by swamps and bogs is described. Pole drains were used in a covered ditch to permit economical use of the land. The film shows details of drainage in one area. Running time is about 10 minutes. Production number is MCWA-TE-4-003.0.

ENGINEERING DIVISION

TYPHUS NOTES. The Typhus Control Section of the Engineering Division reported that 3,397 rats were examined for ectoparasites prior to DDT dusting operations in the nine Southeastern states for the period of September 1945 through May 1946. The total number of ectoparasites taken from these rats was 69,285. After DDT treatment 33,945 ectoparasites were removed from 2,877 rats. This indicated a reduction of 43 percent in the total ectoparasite population.

Of the total number of ectoparasites taken before dusting operations were carried out, 8,848 were *Xenopsylla cheopis*, the common rat flea. After dusting operations 1,203 of the total number of ectoparasites removed were *Xenopsylla cheopis*. This was an indicated 85 percent reduction in the common rat flea population.

Number of specimens of rat blood sera taken before operations was 1,893. Of these, 645 showed positive typhus complement-fixation reactions. Of the 1,908 specimens of sera taken after dusting operations were performed, only 472 showed positive reactions, thus indicating a 40 percent reduction in positive results.

PEST CONTROL COURSE AT PURDUE. More than 80 sanitary inspectors and other state, county, and city officials concerned with the control of insect and rodent pests met at Purdue University, Lafayette, Indiana, April 29 to May 3, for a short course on pest control problems.

The course was sponsored by Purdue University in cooperation with the U. S. Fish and Wildlife Service, U. S. Public Health Service, and Indiana State Board of Health.

The course was designed to provide officials with a thorough understanding of prevalent pest problems, and procedures to follow in handling such problems.

Instructions included discussions and lectures on: (1) the fundamentals of insect and rodent biology; (2) insecticides and rodenticides, with special reference to the new organic compounds such as DDT, 666, 1080, and ANTU, and methods of applying these controls; (3) pest control recommendations to the public; (4) insect- and rodent-borne diseases; (5) ratproofing; (6) garbage

and refuse disposal systems as they relate to pest control; (7) organization and conduct of the Sanitation Program; and (8) demonstrations in the use of poisoned baits and gases, ratproof construction, and food handling.

The following is a list of speakers who participated in the program from the U. S. Public Health Service, together with the titles of their discourses: S. A. San. Eng. J. G. Terrill, Jr., "The Goal of a Community Sanitation Program;" Eng. (R) Herschel Engler, "The Proper Care of Foodstuffs on Residential and Business Properties;" and S. A. San. Eng. John S. Wiley, "Constructional Ratproofing in Cities," and "Food Handling for Rat Control."

AIRPLANE LARVICIDAL TREATMENT. The U. S. Public Health Service is cooperating with the Corps of Engineers in supplying larvicidal treatment to the regions of the Sardis and Arkabulton Reservoirs in Mississippi. Lakes created by these dams are given larvicidal treatment by use of an airplane. Both the planes and the pilots are furnished by MCWA. The work is being done on a reimbursable basis.

DOSAGES OF 1080 USED FOR KILLS. The accompanying table was taken from a report of the National Research Council. It indicates the amounts of 1080 poison necessary to kill various animals.

ANIMAL	AMOUNT OF 1080 IN MILLIGRAMS PER KILOGRAM OF BODY WEIGHT	PERCENT KILLED
Albino rat	5-7	50%
Norway rat, wild (*Rattus norvegicus*)	3-7	50%
Roof rat (*R. rattus* subsp.)	1-4	50%
Cat	0.35-0.5	50%
Dog	0.1-0.2	50%
Goat	0.7	50%
Pig	0.3	50%
Horse	1	50%
Monkey (*rhesus*)	5-7.5	50%
Chicken (domestic)	10-30	50%
Mourning dove (*Zenaidura macroura*)	10	33%
English sparrow (*Passer domesticus*)	2.7	100%

FIELD NOTES

MISSISSIPPI REPORTS CONTROL ACTIVITIES

Mississippi reported that a maximum number of MCWA zones were in operation during the calendar year of 1945. Three new prisoner-of-war branch camps were established, two air bases were reactivated, and the recreation area at Camp Shelby was included in control operations.

Control operations for the state as as a whole were somewhat more successful than for the 1944 period.

The relatively cool, wet season greatly increased the control problem, especially in the Lake Washington, Belzoni, and the Clarksdale areas where the degree of "quad" control was not as good as in the previous year. On the other hand, significant improvements in control were evident in the Gulfport Air Base, Greenwood, Indianola, and Leland zones.

In some areas the scarcity of suitable foremen and laborers were limiting factors affecting the results which could otherwise be expected.

The use of DDT as a residual house spray was practiced as a supplement to larviciding in zones where a high "quad" density prevailed.

TRANSFER OF THE DIVISION OF MOSQUITO CONTROL IN THE TERRITORY OF HAWAII

The value of the service rendered by this Division, which was established by the U. S. Public Health Service to cope with a definite health problem, is fully recognized and appreciated by the Board of Health of the Territory of Hawaii and people of this area. Its value is recognized to the extent that they have expressed their desire to continue the practices introduced and to accept the responsibility for a continuing program of mosquito control. In the transfer of the Division from the U. S. Public Health Service to the Territory of Hawaii, the mosquito control program is set up under local leadership and sponsored through local funds. The following is quoted from the narrative report for May 1946 sent to Headquarters from the Board of Health, Territory of Hawaii.

"The Division of Mosquito Control, formerly Dengue Mosquito Control, was transferred from the auspices of the U. S. Public Health Service to the Territory of Hawaii on the 31st of May 1946. This culminates the efforts of all interested individuals in directing the attention of the people of Hawaii to the need and desirability of an active mosquito control program. During the middle of the month, the Bureau of the Budget approved the establishment of twenty-seven positions to be financed from the Governor's contingent fund. This is in addition to the previously established positions of a Director for the Division of Mosquito Control and a Medical Entomologist for the Board of Health. These positions have been classified by the Territorial Civil Service Commission, and all but two inspectors of the present force have qualified for transfer to the Territorial program. The program will continue to operate in the manner in which it has operated for the past several months. Records will continue to be kept and emphasis will be continued according to the plan of inspection, correction, and education.

"The history of mosquito control in the Territory of Hawaii has been one of an earnest desire to effect the control of mosquitoes. It has been supported heretofore by various private and public agencies and has now reached recognition again as a function of the Board of Health."

FLY CONTROL IN HILO

The city of Hilo, Hawaii, was damaged seriously by seismic waves on April 1. Mosquito operations were suspended for a month because the four members of the

United States Public Health Service Mosquito Control Division at Hilo were called upon to assist with the cleaning, condemning, and disposing of contaminated and damaged food and drug supplies.

When large quantities of food, chicken feeds, and mashes became breeding places for house flies, members of the Mosquito Control Division were detailed to spray them.

A larviciding jeep brought from Honolulu was used for spraying five precent DDT in kerosene on all spots where intensive fly breeding was occurring It was observed that newly-emerged larvae contacting the sprayed surfaces soon showed signs of discomfort and poisoning.

Two power trucks obtained from the United States Public Health Service Rodent Control Division at Honokoa were used for spraying a one percent DDT water emulsion as a residual spray on surfaces where adult flies lit. Observations showed that flies captured twenty-four hours or less after spraying operations were performed in these areas exhibited signs of DDT poisoning and died within six hours after capture. Flies taken from unsprayed areas lived for periods longer than twenty-four hours.

Effectiveness of the spraying in preventing wholesale outbreaks of flies was demonstrated in one section which had been overlooked unintentionally during the spraying period. A serious outbreak of flies occurred in this section. After spraying, the number of flies was perceptibly less. Spraying is continuing on a spot basis until clean-up operations are stabilized.

RIVAL OF DDT

According to an article in "Se-Mo DDT News," monthly bulletin issued by the U. S. Public Health Service in cooperation with the Missouri State Health Department, DDT has an important rival in 1068 Velsicol. This is a compound of chlorinated hydrocarbon, a product of the University of Illinois insect experiments. It is said to be three to four time as toxic to house-flies as is DDT.

MALARIA INVESTIGATIONS IN MEMPHIS

Malaria investigations are being carried out in Memphis, Tennessee, in an effort to develop active immunities against malaria in experimental hosts such as chickens, ducks, and monkeys, with the hope that such a successful issue may be duplicated in man. In connection with these studies, certain investigations of the life history of malaria parasites have been made. These are concerned primarily with the exerythrocytic phases, easily demonstrable in bird malaria, but which have not been shown thus far in malaria infections of mammals.

(Continued from page 15)

A PRACTICAL FIELD TRAINING COURSE.

PROGRAM FOR RECORD ANALYSTS

A detailed program is set up for record analysts who take the training course. They review and evaluate all records and report forms recommended by the State Department of Health to the local unit, and all records designed locally for the recording of local health services. Opportunity is given for constructing record and report forms for administrative, service, and statistical purposes. Each is trained in the technics of computing and applying public health statistics to local health problems, and in using these statistics as a means to interpret the health records of both lay and professional groups of the community.

(Concluded on page 33)

CARTER MEMORIAL LABORATORY NOTES

CHEMICAL INVESTIGATIONS OF DDT

Penetrability of various solvents and DDT into poplar wood surfaces has been tested. Solutions used were 5 percent DDT in acetone, xylene, Solvesso #2, kerosene, Velsicol AR 50, and the Standard United States Public Health Service xylene emulsion. In each case, almost all the DDT was recovered from the top 1/8 inch layer of the wood. Only the more volatile solvents such as acetone and xylene were found to deposit most of the DDT within the top 0.005 ± 0.002 inches of the wood surface. In the other cases, less than half the DDT applied was recovered from the very top layer. Indications are that only a fraction of the DDT applied to wood surfaces is actually available for contact with insects.

Tests have been run to extract DDT from mud. After laboratory tests showed that several samples of water were no longer toxic to *Anopheles quadrimaculatus* larvae, the DDT was extracted from the mud in the water. Results showed that enough DDT was present in the mud samples to be toxic to *A. quadrimaculatus* larvae, but in natural conditions the DDT was apparently tied up in such a way that it could not affect the larvae.

Several emulsifiers were tested, and it was found that Triton X-155 and Triton X-100 were equally good. Both emulsifiers were quite satisfactory when used at the rate of 2 percent in 35 percent DDT-xylene concentrate.

LARVICIDE INVESTIGATIONS

On the basis of extensive field studies made during the past season, a method of using DDT in an oil mist spray for larvicidal purposes has been recommended. The formula consists of 0.625 percent technical DDT and 0.5 percent spreading agent (B 1956) in No. 2 fuel oil. Air pressure sprayers equipped with atomizing nozzles having a discharge rate of 3.0 gallons per hour at a pressure of 40 per square inch are used. A pace of 75 feet per minute permits the application of one gallon per acre, figured on the basis of a 30 ft. swath width. This width can be obtained readily even though there is a barely perceptible breeze. If properly applied, a dosage of 0.05 lb. DDT per acre is adequate to insure 90 percent control of all instars of anopheline larvae. In addition, it controls most culicine larvae. If the area is not over-dosed, fish and other aquatic organisms should not be harmed.

When DDT in an oil mist spray was used routinely on the Savannah, Ga., control project, material and labor cost $1.15 to $1 35 per acre and required 1.7 man-hours per acre. In paris green hand dusting programs, the cost per acre for materials and labor is $2.25 and 3.10 man-hours are required.

In contrast to paris green, DDT kills even the smallest larvae. Consequently, when DDT is used on a larviciding program, an extension of two or three days of the larviciding cycle may be expected.

Laboratory tests with a number of candidate larvicides show that dichloro-diphenyl-dichloroethane (DDD or TDE) possess toxicity equal to or greater than that of DDT. The gamma isomer of hexachloro-cyclohexane (666) is nearly as toxic as DDT and is sufficiently soluble in water to be highly toxic to mosquito larvae.

EFFECTS OF DDT LARVICIDING ON FISH AND ASSOCIATED ORGANISMS

Fish population studies indicated that 18 routine treatments with DDT dust at the rate of 0.1 pound per acre had little effect on the fish population. No killing of fish was noted during 18 routine treatments using one gallon of fuel oil and 0.025 pound of DDT per acre. Treatments at the rate

of a gallon of fuel oil and 0.1 pound of DDT per acre were detrimental to fish life. With treatments at this rate the first kills were observed sometime between the third and tenth applications, depending on the type of pond. After 11 to 22 treatments, the total fish population was drastically reduced in shallow ponds used in the experiments..

DDT fuel oil solutions applied at the rate of 0.05 pound of DDT per acre did not give such marked kills of fish as applications at 0.1 pound per acre. The first kill occurred between the third and thirteenth treatments. Indications to date are that 0.05 pound of DDT per acre may be used for mosquito control operations without appreciable damage to fish.

Gross observations were made before and after the various treatments to determine the effects of such treatment on surface Coleoptera and Hemiptera. These insects were killed in considerable numbers by all the concentrations of DDT in fuel oil which were tested.

DDT-fuel oil solutions killed the large surface insects such as Dytiscidae, Gyrinidae, Hydrophilidae, and Corixidae at concentrations as low as 0.025 pound of DDT per acre. However, the kills resulting from applications of 0.05 or 0.025 pound of DDT per acre were proportionally lower than those used at the rate of 0.1 pound per acre. As was true also for treatments with dust, few significant changes occurred due to any single treatment. The seasonal effects of routine treatments with DDT in fuel oil, as indicated by a comparison of the population of surface organisms in the treated and check ponds, were quite marked. There was an increase in the number of Oligochaeta, Nematoda, and Copepoda, and a decrease in the Chironomidae, Hemiptera, Coleoptera, and Ephemeroptera. Insects in general decreased in number in the treated ponds, with the largest decrease occurring among the Chironomidae.

The seasonal trend of the population of surface organisms was affected somewhat by routine treatments with dust used at the rate of 0.1 pound of DDT per acre but the changes were not as great as those caused by treatments with solutions of DDT in fuel oil.

INSECTICIDE INVESTIGATIONS

In a series of field tests, comparisons were made of a mixture containing equal parts of the emulsifiers Span 20 and Tween 20, at concentrations of 1 to 4 percent in DDT-xylene-water emulsions, and a 4 percent Triton X-100 emulsion. Comparisons were made of: (1) stability of emulsion; (2) type of coverage; (3) appearance of residue; (4) rate of drying; (5) amount of streaking; and (6) shape of the dried spots in over-sprayed areas. The mixture of Span 20 and Tween 20 at both 3 and 4 percent made satisfactory emulsions for field use. The 1 and 2 percent concentrations were stable but left somewhat different type of deposits in oversprayed areas.

Laboratory investigations showed that when *A. quadrimaculatus* adults were exposed for 60 minute periods to plywood which had been sprayed with DDT at the rate of 200 mg. per sq. ft., mortalities occurred within 48 hours after exposure. Mosquitoes exposed after the DDT deposits had been on the plywood for a week showed mortalities of 95 percent. Exposure at the end of two months gave 90 percent mortalities, and at the end of 10 months, 55 percent. Equivalent applications on fabrics such as mohair, curtains and canvas, and on well-dried furniture varnishes gave results equal to the plywood standard. When the DDT was applied to casein water paint, weathered enamel, fiberboard, wall paper, and wire screen, results were three-fourths as effective. Results were one-half as effective when DDT was applied to whitewash, spar varnish, and fresh paints. Very little residue was left on linoleum and adobe-like mud surfaces. Certain blue and green wallpaper showed discoloration where they were sprayed.

Samples of DDT from various commercial manufacturers showed little difference in toxicity to mosquitoes. The male mosquitoes are more susceptible to DDT than the females. This is true also for houseflies which are being used as additional test insects.

Field work on the control of blowflies around seafood processing plants indicated that adult flies rest on vegetation in the immediate vicinity of the buildings. This is especially true at night. Applications of 300 mg. DDT per sq. ft. (as 5 percent DDT-xylene emulsion) to the vegetation within 25 feet of the oyster house, to the wharf, refuse piles of crab shells, and the walls of the cooking shelter, reduced counts of flies from 200 per inspection before treatment to 20 per inspection after treatment. This was for a period of one month before cool weather started.

TYPHUS CONTROL INVESTIGATIONS

There is a popular conception that ANTU causes the feet of rats to be irritated so the rats lick or chew the feet, and thus acquire a lethal dose of the poison. A series of tests has shown no such indication of irritation. This was true when a dust containing 50 percent ANTU and 10 percent DDT was confined to the hind feet of white rats by means of rubber boots for a period of about 24 hours. This agrees with field and laboratory observations of large numbers of ANTU-poisoned rats which have failed to show visible evidence of irritation, and whose feet have not been swollen or chewed.

The possibility that ANTU might cause a sensory reaction which would not result in visible signs was considered A human subject exposed an area of skin one inch in diameter or the palm of his hand to a dust containing 50 percent ANTU and 10 percent DDT. No sensory reactions or irritation were noted.

In a further test, three adult Norway rats were forced to stand for one minute on a floor covered with a dust containing 20 percent ANTU and 10 percent DDT. A fourth rat was exposed to 100 percent ANTU. These rats were kept under constant observation for seven hours. During this time they preened themselves and behaved in what appeared to be a normal manner, paying no unusual attention to their feet. At the end of the seven hours, all were definitely ill and after 22 hours, were dead. Apparently irritation is not involved in obtaining a lethal dose of ANTU. Rats seem to acquire a lethal dose in the normal process of preening and cleaning the feet and parts of the body which have been exposed to the ANTU.

EQUIPMENT DEVELOPMENT

Two sprayers, with capacities of one quart and one gallon respectively, have been developed in an attempt to produce a small sprayer suitable for household use in applying DDT.

The smaller unit is a modified quart size "Sure-Shot" Sprayer with a flat, fan-shaped spray pattern nozzle and built-in hand pump. This small sprayer is easy to use as well as convenient for places which are difficult to spray. When charged with three half-pints of spray, the ceilings and walls of a medium size room can be treated before the unit needs refilling.

The one gallon capacity unit was constructed by altering a 1-1/2 gallon "Hudson" sprayer with screw-in type internal hand pump. The tank and pump cylinder were reduced in length to give the desired capacity. A four foot length of 1/4 inch I. D. light-weight hose, a shut-off valve, a 12 inch wand, and a "Spraying System" No. 1/4 T6501 nozzle completed the unit. This sprayer is light in weight and easy to operate. When charged with three quarts of spray, the ceilings and walls of three or four medium size rooms can be treated.

SPECIAL STUDIES

In a special study of methods of controlling cockroaches, particularly the German roach, it was found that a combination of 5 percent DDT spray to help locate all roach nests and hiding places, followed by a thorough application of a 10 percent DDT dust was effective. Particular attention was given to hiding places of roaches discovered during the spraying treatment. This method reduced heavy infestations below the nuisance level within one week. No roaches were reported from 3 to 16 weeks after the applications. After 2-1/2, 5 or 10 percent DDT-xylene emulsions were applied to mattresses and bed springs, bedbugs were controlled completely for periods of at least 4 months. A knapsack sprayer with a "Spraying Systems" flat-fan atomizing nozzle No. 50-01 was used for this work.

ANOPHELES HOST PREFERENCE STUDIES

Data on *Anopheles* host preference has been collected from the Extended Malaria Control Areas. Results from South Carolina, Mississippi, and Florida, the three states submitting the most adult *Anopheles* during June, July, and August of 1945, indicate a substantial reduction in human blood meals of *Anopheles* in areas sprayed with DDT as compared to unsprayed check areas. Data from regular program areas for the preceding year were quite different from those for the unsprayed areas in 1945. This may have been due to the fact that there was a change in emphasis placed on the types of collecting places.

(Continued from page 29)

A PRACTICAL FIELD TRAINING COURSE.

SUMMARY

1. The training course, or Internship in Public Health, has been developed as a field training course designed to give practical experience and training to those engaged in, or who will be engaged in carrying out, public health practices.

2. Training courses are set up for health officers, health administrators, health educators, nurses, veterinarians, sanitary engineers, sanitarians, record analysts, and other types of personnel working in health departments.

3. The course consists of 12 weeks of practical work. The first week and a half are spent in Atlanta on general orientation, and the balance of the period in Savannah and the near vicinity.

4. Training includes instruction through the use of demonstrations, films, discussions, field trips, and other media which best meet the needs of the particular problem involved.

ANNOUNCEMENT OF FUTURE ACTIVITIES

It cannot be emphasized too strongly that practically the entire time of the trainee during the twelve weeks period is spent doing the work on the job, under close supervision. The United States Public Health Service staff is an integral part of the local health department, operating under the administrative direction of the health officer. However, the group absorbs the training load so that there is no interference to the regular work of the health department. Courses are scheduled at intervals of approximately three months. The next course will start in September 1946. It will be devoted primarily to the training of sanitarians because of the nature of the requests from state health departments for assistance in training new personnel to carry on sanitation activities.

TABLE I

MCWA Larvicide, Minor and Major Drainage work

FEBRUARY 24, - MARCH 23, 1946

STATE	Areas in Operation	RESIDUAL SPRAYING		LARVICIDAL DRAINAGE				DRAINAGE OPERATIONS											Total Man Hours
				LARVICIDE USED		SURFACES TREATED ACRES		CLEARING		Cleaning Lin. ft.	NEW DITCHING				Ditch Lining Lin.Ft.	Underground Drainage Lin.Ft.	Fill C.Y.	Water Surf. Eliminated Acres	
		Number Houses Sprayed	Pounds DDT Used	Oil Gals.	Paris Green Lbs.	Oiled	Dusted	Aquatic Veg. Acres	Land Veg. Acres		Hand	Lin.Ft. Mach.	Dynamite	Total Cu.Yds.					
Alabama	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9,021
Arkansas	23	18,437	11,011	---	---	---	---	37	45	106,665	6,638	---	---	818	---	---	---	3	43,817
California	1	---	---	---	---	---	---	---	---	25	---	---	---	---	---	---	---	---	608
District I	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	288
Florida	5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2,976
Georgia	20	5,259	6,140	---	---	---	---	3	11	21,400	---	---	---	---	---	---	4,896	---	13,984
Louisiana	3	---	---	---	---	---	---	1	3	18,700	---	---	---	---	---	---	37	---	12,631
Mississippi	17	13,196	9,404	---	---	---	---	1	4	600	---	---	---	---	---	---	---	---	28,677
Missouri	4	7,132	5,954	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12,084
North Carolina	4	536	368	---	---	---	---	---	1	55,800	1,000	---	900	759	---	---	---	---	6,381
Oklahoma	4	1,801	1,063	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5,460
Puerto Rico	5	---	---	770	1,456	69	1,103	2	3	154,253	1,500	---	---	275	---	---	---	---	25,954
South Carolina	9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11,376
Tennessee	3	142	158	---	---	---	---	---	---	966	2,200	---	---	878	3,767	---	1,108	1	10,438
Texas	14	755	278	572	---	27	---	10	1	14,784	3,100	---	---	424	---	---	---	40	24,564
Virginia	2	---	---	---	---	---	---	---	---	52,489	4,016	---	---	191	---	---	151	---	3,266
TOTAL	123	47,258	34,376	1,342	1,456	96	1,103	54	68	425,682	18,454	---	900	3,345	3,767	---	6,192	44	211,525
TOTAL 1-27 - 2-23	82	---	---	1,134	1,684	94	1,344	32	35	362,983	40,836	---	3,343	9,335	1,967	500	2,799	24	134,027

TABLE II

MCWA Payroll and Personnel Report

MARCH 1946

STATE	COMMISSIONED		PROF. & SCI.		SUB-PROF.(1)		C. A. F.		CUSTODIAL AND PER HOUR		PER DIEM AND PER HOUR		TEMPORARY		TOTAL		PERCENT OF TOTAL	
	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY
Alabama	4	1,307	1	238	22	3,733	3	414	20	2,637	---	---	52	8,333	102	16,662	4.19	4.21
Arkansas	9	2,672	9	2,563	114	15,552	36	5,945	218	23,335	---	---	---	---	386	50,067	15,86	12.67
California	4	1,437	---	---	5	901	2	325	---	---	---	---	---	---	11	2,663	0.45	0.67
District of Columbia	1	333	---	---	---	---	---	---	---	---	---	---	---	---	1	333	0.04	0.08
Florida	4	1,508	6	1,641	46	8,045	9	1,415	17	2,630	---	---	13	1,639	95	16,878	3.90	4.27
Georgia	10	2,964	5	1,155	32	6,363	7	1,318	7	1,745	---	---	36	5,220	97	18,765	3.99	4.75
Illinois	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Indiana	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Kansas	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Kentucky	3	913	2	526	2	546	3	429	1	187	---	---	23	2,415	34	5,016	1.40	1.27
Louisiana	7	2,080	3	1,290	30	9,110	6	1,641	37	7,329	---	---	50	1,915	133	23,365	5.46	5.91
Maryland	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mississippi	11	3,502	5	1,222	39	6,113	8	1,296	12	1,719	---	---	183	13,922	258	27,774	10.60	7.03
Missouri	2	592	1	229	8	1,417	4	752	6	1,020	---	---	60	7,695	81	11,705	3.33	2.96
North Carolina	6	1,648	3	942	5	1,570	4	667	16	3,454	---	---	39	3,240	73	11,521	3.00	2.91
Oklahoma	3	1,298	1	246	19	3,290	4	467	4	627	---	---	13	1,211	44	7,139	1.81	1.81
Oregon	---	96	---	---	1	204	---	---	---	---	---	---	---	---	1	300	0.04	0.08
South Carolina	6	1,869	5	2,790	26	5,826	6	1,105	32	5,611	---	---	8	1,857	83	19,058	3.41	4.82
Tennessee	3	894	4	806	15	2,578	4	696	22	3,691	---	---	38	3,147	86	11,812	3.53	2.99
Texas	7	2,205	5	1,430	23	5,058	8	1,363	53	9,357	---	---	19	1,290	115	20,703	4.73	5.24
Virginia	1	333	1	348	6	1,193	3	497	18	2,602	---	---	---	---	29	4,973	1.19	1.26
Aedes aegypti																		
Alabama	---	---	---	---	4	1,173	---	148	---	---	---	---	---	---	4	1,321	0.16	0.33
Florida	---	---	---	---	20	3,214	---	---	---	---	---	---	2	293	22	3,507	0.90	0.89
Georgia	---	---	---	---	---	333	---	---	---	---	---	---	---	---	---	333	---	0.08
Louisiana	1	285	---	---	7	1,926	1	227	---	---	---	---	---	---	9	2,438	0.37	0.62
South Carolina	1	651	---	---	5	1,025	1	151	---	---	---	---	---	---	7	1,827	0.29	0.46
Texas	2	667	---	---	12	2,800	1	146	---	---	---	---	1	476	16	4,089	0.66	1.03
Hq. and Dist. (2)	88	33,466	27	7,508	50	10,039	221	39,284	51	9,551	2	1,006	105	12,673	544	113,527	22.35	28.72
Honolulu, T. H.	2	710	---	---	28	5,321	2	366	1	189	---	---	---	---	33	6,586	1.36	1.67
Puerto Rico	7	2,046	3	856	5	917	5	1,151	10	1,123	140	6,846	---	---	170	12,939	6.98	3.27
Total	182	63,476	81	23,790	524	98,247	338	59,803	525	76,807	142	7,852	642	65,326	2,434	395,301	100.00	100.00
Percent of Total	7.48	16.06	3.33	6.02	21.53	24.85	13.89	15.13	21.57	19.43	5.83	1.99	26.37	16.52	100.00	100.00		

(1) Includes Entomological Inspectors.
(2) Includes Headquarters and District Offices, Mobile Units, Malaria Survey, Imported Malaria Control, Special Studies, and employees temporarily attached to Headquarters pending assignment to states.

NOTE: No. - Includes civilian personnel as of last pay period in month. Includes commissioned officer personnel as of last day of month.
Pay - Includes totals of all payrolls covering periods ending during the month; supplemental and final payrolls for previous months processed during the current month.

TABLE III

MCWA Expenditures and Liquidations by Major Items

MARCH 1946

	CONTINENTAL U. S.	PERCENTAGE OF TOTAL	PUERTO RICO	PERCENTAGE OF TOTAL
01 Personal Services	$382,362.00	156.75	$12,939.00	88.64
02 Travel	28,298.61	11.60	105.90	0.73
03 Transportation of Things	13,861.46	5.68	---	---
04 Communication Services	838.24	0.34	17.90	0.12
05 Rent and Utilities	5,047.37	2.07	---	---
06 Printing and Binding	4,388.30	1.80	---	---
07 Other Contractual Services	17,063.80	7.00	10.00	0.07
08 Supplies and Materials	108,481.24	44.47	1,524.75	10.44
09 Equipment	99,443.95	40.77	---	---
10 Land and Buildings	---	---	---	---
TOTAL	$243,934.59	100.00	$14,597.55	100.00
Expenditures Other Than Personal Services	$138,427.41	56.75	$ 1,658.55	11.36

TABLE IV

Typhus Expenditures and Liquidations by Major Items

MARCH 1946

	CONTINENTAL U. S.	PERCENTAGE OF TOTAL	PUERTO RICO	PERCENTAGE OF TOTAL
01 Personal Services	$75,622.00	93.79	---	---
02 Travel	---	---	---	---
03 Transportation of Things	1,000.00	1.24	---	---
04 Communication Services	12.25	0.01	---	---
05 Rent and Utility Services	16.74	0.02	---	---
06 Printing and Binding	---	---	---	---
07 Other Contractual Services	876.71	1.09	---	---
08 Supplies and Materials	2,772.15	3.44	---	---
09 Equipment	330.98	0.41	---	---
10 Land and Buildings	---	---	---	---
TOTAL	$80,630.83	100.00	---	---
Expenditures Other Than Personal Services	$ 5,008.83	6.21	---	---

TABLE V

Typhus Payroll and Personnel Report

MARCH 1946

AREA	COMMISSIONED		PROF. & SCI.		SUB - PROF.		C. A. F.		CUSTODIAL AND PER HOUR		PER DIEM AND PER HOUR		TEMORARY		TOTAL		PERCENT OF TOTAL	
	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY
Alabama	1	.285	1	344	10	2,684	--	---	22	3,876	--	---	15	2,669	49	9,858	12.73	13.04
Arkansas	--	---	--	---	--	116	--	---	--	---	--	---	--	---	--	116	---	0.15
Florida	--	---	--	---	13	3,147	1	562	1	302	--	---	5	598	20	4,609	5.19	6.09
Georgia	2	578	5	1,821	37	9,999	1	105	1	544	--	---	15	2,828	61	15,875	15.84	20.99
Louisiana	--	---	--	---	12	3,348	--	---	--	277	--	---	11	1,836	23	5,461	5.97	7.22
Mississippi	--	---	2	467	9	1,598	--	---	8	928	--	---	--	---	19	2,993	4.94	3.96
North Carolina	2	570	--	---	4	1,107	1	201	3	529	--	---	16	2,848	26	5,255	6.75	6.95
South Carolina	--	---	2	509	11	2,219	--	---	10	1,270	--	---	8	764	31	4,762	8.05	6.30
Texas	--	---	3	688	46	7,937	1	139	12	1,638	--	---	16	2,361	78	12,763	20.26	16.88
Tennessee	--	---	--	---	1	267	--	---	6	447	--	---	10	1,215	17	1,929	4.42	2.55
Virginia	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	---	---
Headquarters	12	4,205	2	662	25	3,741	3	530	9	1,142	--	---	7	922	58	11,202	15.07	14.81
Puerto Rico	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	---	---
Savannah Unit, Ga.	1	343	1	294	1	162	--	---	--	---	--	---	--	---	3	799	0.78	1.06
Total	18	5,981	16	4,785	169	36,325	7	1,537	72	10,935	--	---	103	16,041	385	75,622	100.00	100.00
Percent of Total	4.67	7.91	4.16	6.33	43.90	48.04	1.82	2.03	18.70	14.48	--	---	26.75	21.21	100.00	100.00		

NOTE: No. - Includes civilian personnel as of last pay period in the month. Includes commissioned officer personnel as of last day of month.
Pay - Includes totals of all payrolls covering periods ending during the month; supplemental and final payrolls for previous months processed during the current month.

TABLE VI

MCWA Larvicide, Minor and Major Drainage Work

MARCH 24 - APRIL 20, 1946

STATE	Areas in Operation	RESIDUAL SPRAYING		LARVICIDAL WORK				DRAINAGE OPERATIONS											Total Man Hours
				LARVICIDE USED		SURFACES TREATED ACRES		CLEARING		Cleaning Lin. Ft.	NEW DITCHING				Ditch Lining Lin. Ft.	Underground Drainage Lin. Ft.	Fill C.Y.	Water Surf. Eliminated Acres	
		Number Houses Sprayed	Pounds DDT Used	Oil Gals.	Paris Green Lbs.	Oiled	Dusted	Aquatic Veg. Acres	Land Veg. Acres		Hand	Lin.Ft. Mech.	Dynamite	Total Cu.Yds.					
Alabama	9	10,149	7,578	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7,868
Arkansas	26	33,316	21,412	1,418	---	107	---	32	6	83,293	10,154	---	---	979	---	---	---	2	50,971
California	1	---	---	439	---	23	---	---	---	---	---	---	---	---	---	---	---	6	1,024
District I		---	---	---	---	---	---	---	---										
Florida	8	3,167	2,842	458	70	15	41	---	1	72	420	---	---	51	---	---	---	---	13,201
Georgia	21	18,876	24,635	---	---	---	---	1	3	3,990	---	---	---	---	---	---	1,893	---	19,171
Kentucky	3	2,662	1,452	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4,208
Louisiana	7	5,263	4,005	2,674	---	99	---	1	4	17,300	110	---	---	11	---	---	---	---	19,505
Mississippi	18	27,561	25,644	1,295	---	66	---	---	3	---	---	---	---	---	---	---	---	---	40,505
Missouri	5	8,703	7,091	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11,775
North Carolina	4	3,004	2,027	---	---	---	---	---	---	1,800	---	---	5,375	4,725	---	20	---	---	9,674
Oklahoma	5	3,601	2,949	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5,656
Puerto Rico	6	---	---	1,196	1,779	74	999	2	3	121,326	935	2,650	---	6,151	---	---	---	---	22,872
South Carolina	26	11,832	5,735	---	---	---	---	---	1	67,200	---	---	---	---	---	---	---	---	28,726
Tennessee	4	6,346	4,401	---	---	---	---	---	1	1,800	951	---	---	329	2,008	---	485	---	12,588
Texas	11	9,054	4,379	818	---	67	---	8	1	9,470	1,758	---	---	488	---	---	---	2	38,133
Virginia	2	---	---	---	---	---	---	---	1	4,869	704	---	---	121	---	---	82	---	2,752
TOTAL	156	143,534	114,150	8,298	1,849	451	1,040	44	24	311,120	15,032	2,650	5,375	12,855	2,008	20	2,460	10	288,599
TOTAL 2-24 - 3-23	123	47,258	34,376	1,342	1,456	96	1,103	54	68	425,682	18,454	---	900	3,345	3,767	---	6,192	44	211,525

TABLE VII

MCWA Payroll and Personnel Report

APRIL 1946

STATE	COMMISSIONED		PROF. & SCI.		SUB-PROF. (1)		C. A. F.		CUSTODIAL AND PER HOUR		PER DIEM AND PER HOUR		TEMPORARY		TOTAL		PERCENT OF TOTAL	
	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY
Alabama	4	1,310	1	242	21	3,660	4	1,025	25	4,075	---	---	96	14,139	151	24,451	4.96	5.10
Arkansas	9	3,364	9	2,285	52	8,389	29	5,174	28	4,934	---	---	289	34,720	416	58,866	13.66	12.27
California	5	1,453	---	266	2	1,838	2	325	---	---	---	---	7	657	16	4,539	0.53	0.95
District of Columbia	1	332	---	---	---	---	---	---	---	---	---	---	---	---	1	332	0.03	0.07
Florida	5	1,752	5	1,395	46	7,575	8	1,275	17	2,242	---	---	112	14,233	193	28,472	6.34	5.93
Georgia	9	3,100	5	1,178	32	6,197	7	1,159	6	2,722	---	---	113	6,345	172	20,701	5.65	4.31
Kentucky	1	400	3	772	1	389	3	441	1	125	---	---	23	3,741	32	5,868	1.05	1.22
Louisiana	6	1,954	4	600	29	3,026	8	1,231	29	2,976	---	---	107	8,938	183	18,725	6.01	3.90
Mississippi	11	3,509	5	1,344	38	6,178	8	1,460	11	2,066	---	---	204	23,338	277	37,895	9.09	7.90
Missouri	2	590	1	229	14	1,853	4	650	2	420	---	---	63	8,424	86	12,166	2.82	2.54
North Carolina	6	2,505	3	942	5	1,250	4	691	11	2,945	---	---	39	5,357	68	13,690	2.23	2.85
Oklahoma	3	2,121	1	509	18	3,681	3	523	4	883	---	---	14	1,745	43	9,462	1.41	1.97
Oregon	---	---	---	---	1	204	---	---	---	---	---	---	---	---	1	204	0.03	0.04
South Carolina	5	1,505	5	1,846	26	7,819	6	1,780	30	8,517	---	---	166	20,864	238	42,331	7.81	8.82
Tennessee	3	1,115	4	1,125	17	2,859	4	770	18	2,931	---	---	38	4,743	84	13,543	2.76	2.82
Texas	7	2,525	6	1,553	21	4,873	8	1,429	42	9,215	---	---	146	14,200	230	33,795	7.55	7.04
Virginia	1	365	1	348	6	1,065	2	340	18	4,571	---	---	---	69	28	6,758	0.92	1.41
Aedes aegypti																		
Alabama	---	---	---	---	4	688	---	114	---	---	---	---	2	251	6	1,053	0.20	0.22
Florida	---	---	---	---	20	3,325	---	---	---	---	---	---	2	146	22	3,471	0.72	0.72
Georgia	---	---	---	---	2	389	---	---	---	---	---	---	---	---	2	389	0.07	0.08
Louisiana	1	284	---	---	6	1,114	1	151	---	---	---	---	---	---	8	1,549	0.26	0.32
South Carolina	1	651	---	---	5	1,032	1	174	---	---	---	---	---	196	7	2,053	0.23	0.43
Texas	2	664	---	---	12	2,431	1	146	---	---	---	---	---	66	15	3,307	0.49	0.69
Hq. and Dist. (2)	88	32,851	25	6,270	57	9,971	215	39,658	72	9,481	2	340	129	18,075	588	116,646	19.30	24.30
Honolulu, T. H.	2	707	---	---	26	5,026	2	366	1	189	---	---	---	---	31	6,288	1.02	1.31
Puerto Rico	7	2,128	2	1,757	5	955	4	1,249	10	1,438	120	5,865	---	---	148	13,392	4.86	2.79
Total	179	65,185	80	22,661	466	85,787	324	60,131	325	59,730	122	6,205	1,550	180,247	3,046	479,946	100.00	100.00
Percent of Total	5.88	13.58	2.62	4.72	15.30	17.87	10.64	12.53	10.67	12.45	4.00	1.29	50.89	37.56	100.00	100.00		

(1) Includes Entomological Inspectors.

(2) Includes Headquarters and District Offices, Mobile Units, Malaria Survey, Imported Malaria Control, Special Investigations, and employees temporarily attached to Headquarters pending assignment to states.

NOTE: No. - Includes civilian personnel as of last pay period in the month. Includes commissioned officer personnel as of last day of month.

Pay - Includes totals of all payrolls covering periods ending during the month; supplemental and final payrolls for previous months processed during the current month.

TABLE VIII

MCWA Expenditures and Liquidations by Major Items

APRIL 1946

	CONTINENTAL U. S.	PERCENTAGE OF TOTAL	PUERTO RICO	PERCENTAGE OF TOTAL
01 Personal Services	$466,554.00	62.07	$13,392.00	85.08
02 Travel	14,243.60	1.90	289.50	1.84
03 Transportation of Things	15,201.49	2.03	---	---
04 Communication Services	2,114.21	0.28	17.34	0.11
05 Rent and Utility Services	5,127.25	0.68	---	---
06 Printing and Binding	4,493.66	0.60	---	---
07 Other Contractual Services	14,065.25	1.87	21.50	0.14
08 Supplies and Materials	128,724.62	17.13	2,019.31	12.83
09 Equipment	119,582.18	15.91	---	---
10 Land and Buildings	---	---	---	---
11 Grants, Subsidies, and Contributions	10,000.00	1.33	---	---
TOTAL	$751,619.06	100.00	$15,739.65	100.00
Expenditures Other Than Personal Services	$285,065.06	37.93	$ 2,347.65	14.92

TABLE IX

Typhus Expenditures and Liquidations by Major Items

APRIL 1946

	CONTINENTAL U. S.	PERCENTAGE OF TOTAL	PUERTO RICO	PERCENTAGE OF TOTAL
01 Personal Services	$69,219.00	290.42	$435.00	100.00
02 Travel	---	---	---	---
03 Transportation of Things	---	---	---	---
04 Communication Services	22.44	0.10	---	---
05 Rent and Utility Services	42.64	0.18	---	---
06 Printing and Binding	---	---	---	---
07 Other Contractual Services	1,170.71	4.91	---	---
08 Supplies and Materials	24,384.39	102.31	---	---
09 Equipment	71,005.32	297.92	---	---
10 Land and Buildings	---	---	---	---
TOTAL	$23,833.86	100.00	$435.00	100.00
Expenditures Other Than Personal Services	$45,385.14	190.42	---	---

TABLE X

Typhus Payroll and Personnel Report

APRIL 1946

AREA	COMMISSIONED		PROF. & SCI.		SUB - PROF.		C. A. F.		CUSTODIAL AND PER HOUR		PER DIEM AND PER HOUR		TEMPORARY		TOTAL		PERCENT OF TOTAL	
	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY
Alabama	1	284	1	229	10	1,820	--	---	18	2,258	--	---	16	2,159	46	6,750	10.67	9.69
Arkansas	--	---	--	---	1	78	--	---	--	---	--	---	--	---	1	78	0.23	0.11
Florida	--	---	1	331	11	1,796	1	66	2	121	--	---	6	875	21	3,189	4.87	4.58
Georgia	5	1,559	7	1,608	38	6,701	1	151	3	240	--	---	38	3,265	92	13,524	21.35	19.42
Louisiana	---	---	1	229	12	2,121	--	---	--	---	--	---	18	2,665	31	5,015	7.19	7.20
Mississippi	--	---	2	467	8	1,401	--	---	8	895	--	---	1	111	19	2,874	4.41	4.13
North Carolina	2	567	--	---	3	641	1	146	--	298	--	---	18	2,948	24	4,600	5.57	6.60
South Carolina	--	---	2	509	11	2,328	--	---	9	1,229	--	---	11	1,329	33	5,395	7.66	7.74
Texas	--	---	4	802	44	7,723	1	146	6	996	--	---	19	2,969	74	12,636	17.17	18.14
Tennessee	--	---	1	172	1	162	--	---	6	447	--	---	11	1,264	19	2,045	4.41	2.94
Virginia	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	---	---
Headquarters	11	3,872	3	870	23	3,547	2	388	9	1,188	--	---	19	2,450	67	12,3155	15.54	17.68
Puerto Rico	--	---	1	435	--	---	--	---	--	---	--	---	--	---	1	435	0.23	0.62
Savannah Unit, Ga.	1	342	1	294	1	162	--	---	--	---	--	---	--	---	3	798	0.70	1.15
Total	20	6,624	24	5,946	163	28,480	6	897	61	7,672	--	---	157	20,035	431	69,654	100.00	100.00
Percent of Total	4.64	9.51	5.57	8.54	37.82	40.89	1.39	1.29	14.15	11.01	--	---	36.43	28.76	100.00	100.00		

NOTE: No. - Includes civilian personnel as of last pay period in the month. Includes commissioned officer personnel as of last day of month.
Pay - Includes totals of all payrolls covering periods ending during the month; supplemental and final payrolls for previous months processed during the current month.

TABLE XI

MCWA Larvicide, Minor and Major Drainage Work

APRIL 21 - MAY 18, 1946

STATE	Areas in Operation	RESIDUAL SPRAYING		LARVICIDAL WORK				DRAINAGE OPERATIONS										Total Man Hours
				LARVICIDE USED		SURFACES TREATED ACRES		CLEARING			NEW DITCHING							
		Number Houses Sprayed	Pounds DDT Used	Oil Gals.	Paris Green Lbs.	Oiled	Dusted	Aquatic Veg. Acres	Land Veg. Acres	Cleaning Lin. Ft.	Hand	Lin.Ft. Mach.	Dynamite	Total Cu.Yds.	Ditch Lining Lin.Ft.	Underground Drainage Lin. Ft.	Fill C.Y.	Water Surf. Eliminated Acres	
Alabama	10	10,064	8,727	---	---	---	---	---	---	27,000	---	---	---	---	----	---	---	---	24,712
Arkansas	24	34,450	22,277	9,127	33	697	41	13	14	41,824	12,594	---	300	781	---	---	---	3	53,897
California	1	---	---	640	---	58	---	1	1	2,500	600	---	---	30	---	---	---	30	1,312
Florida	8	9,503	7,691	1,239	67	81	18	1	---	9,200	1,145	---	---	130	---	---	---	---	21,450
Georgia	21	24,486	36,244	---	3	---	2	1	---	---	230	---	--	15	---	---	395	---	19,709
Kentucky	3	2,814	1,610	---	---	---	---	---	---	---	----	---	---	---	---	---	---	---	4,031
Louisiana	9	11,345	6,189	10,415	---	387	---	2	2	30,819	---	---	40	148	---	---	---	---	29,116
Mississippi	18	26,691	28,497	965	---	59	---	1	1	18,000	---	---	---	---	---	---	---	---	35,545
Missouri	7	8,138	6,313	487	450	10	180	---	2	7,900	---	---	---	---	---	---	---	---	12,331
North Carolina	11	6,052	4,069	---	---	---	---	---	---	8,215	1,300	---	3,850	3,452	---	---	---	---	11,540
Oklahoma	4	4,008	3,582	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5,223
Puerto Rico	6	---	---	1,302	1,750	115	1,257	5	3	125,344	17,700	4,100	---	910	---	---	---	10	23,397
South Carolina	25	16,340	9,639	260	---	7	---	6	---	91,219	---	---	---	---	---	---	---	---	34,341
Tennessee	4	7,006	4,937	294	---	28	---	---	4	9,114	1,200	---	---	230	339	---	3	---	12,871
Texas	11	13,951	1,107	1,915	---	98	---	8	2	1,500	---	---	---	---	---	---	---	---	40,836
Virginia	2	6	35	508	---	3	---	---	1	14,203	2,120	---	---	156	---	---	---	---	3,356
TOTAL	164	174,854	140,917	27,152	2,303	1,543	1,498	38	30	386,838	36,889	4,100	4,190	5,852	339	---	398	43	333,667
TOTAL 3/23 - 4/20	156	143,534	114,150	8,298	1,849	451	1,040	44	24	311,120	15,032	2,650	5,375	12,855	2,008	20	2,460	10	288,599

TABLE XII

MCWA Payroll and Personnel Report

MAY 1946

STATE	COMMISSIONED		PROF. & SCI.		SUB-PROF.(1)		C. A. F.		CUSTODIAL AND PER HOUR		PER DIEM AND PER HOUR		TEMPORARY		TOTAL		PERCENT OF TOTAL	
	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY
Alabama	3	1,020	1	274	22	3,995	4	660	25	3,225	---	---	111	13,945	166	23,119	5.55	3.89
Arkansas	9	3,364	9	3,216	53	14,802	29	8,115	24	7,049	---	---	284	58,566	408	95,112	13.64	15.99
California	5	1,449	---	---	2	1,465	2	487	---	---	---	---	8	2,349	17	5,750	0.57	0.97
District of Columbia	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Florida	6	2,013	5	1,440	44	7,735	8	1,281	17	2,244	---	---	109	14,819	189	29,532	6.32	4.96
Georgia	7	2,245	9	1,965	27	4,908	7	1,159	7	883	---	---	51	7,691	108	18,851	3.61	3.17
Kentucky	1	668	3	825	1	204	3	434	1	125	---	---	22	2,963	31	5,219	1.03	0.88
Louisiana	6	1,841	4	1,095	32	5,912	8	1,535	24	3,715	---	---	104	14,489	178	28,587	5.95	4.81
Mississippi	11	3,492	3	2,031	36	8,635	7	1,916	10	2,138	---	---	223	38,474	290	56,686	9.69	9.53
Missouri	3	888	1	344	11	2,612	4	987	---	282	---	---	79	14,202	98	19,315	3.27	3.25
North Carolina	6	1,790	3	1,011	6	1,567	4	687	6	1,516	---	---	43	5,591	68	12,162	2.27	2.04
Oklahoma	3	1,104	1	369	15	4,678	5	976	3	837	---	---	14	2,688	41	10,652	1.37	1.79
Oregon	---	---	---	---	1	831	---	---	---	---	---	---	---	---	1	831	0.03	0.14
South Carolina	4	1,563	5	1,948	45	12,103	7	1,641	12	2,645	---	---	166	31,641	239	51,541	7.99	8.66
Tennessee	3	904	4	1,035	17	2,770	3	649	15	2,193	---	---	48	4,843	90	12,394	3.01	2.08
Texas	6	1,952	8	2,940	22	6,220	8	2,098	24	6,968	---	---	177	19,732	245	39,910	8.19	6.71
Virginia	1	343	1	522	5	1,498	1	429	18	3,836	---	---	4	566	30	7,194	1.00	1.21
Aedes aegypti																		
Alabama	---	---	---	---	3	608	---	---	---	---	---	---	3	348	6	956	0.20	0.16
Florida	---	---	---	---	19	2,783	---	---	---	---	---	---	1	146	20	2,929	0.67	0.49
Georgia	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Louisiana	1	285	---	---	---	---	1	151	---	---	---	---	---	---	2	436	0.07	0.07
South Carolina	---	---	---	---	5	1,288	1	227	---	---	---	---	---	---	6	1,515	0.20	0.25
Texas	---	---	---	---	11	3,500	1	219	---	---	---	---	2	286	14	4,005	0.47	0.67
Hq. and Dist.(2)	84	31,456	24	8,464	55	13,225	210	55,210	44	8,697	3	397	152	30,840	572	148,289	19.12	24.92
Honolulu, T. H.	2	710	---	---	26	4,755	1	183	1	189	---	---	---	---	30	5,837	1.00	0.98
Puerto Rico	8	2,476	1	430	5	1,432	5	1,835	7	1,451	117	6,541	---	---	143	14,165	4.78	2.38
Total	169	59,563	82	27,909	463	107,526	319	80,879	238	47,993	120	6,938	1,601	264,179	2,992	594,987	100.00	100.00
Percent of Total	5.65	10.01	2.74	4.69	15.48	18.07	10.66	13.59	7.95	8.07	4.01	1.17	53.51	44.40	100.00	100.00		

(1) Includes Entomological Inspectors.

(2) Includes Headquarters and District Offices, Mobile Units, Malaria Survey, Imported Malaria Control, Special Investigations, and employees temporarily attached to Headquarters pending assignment to states.

NOTE: No. - Includes civilian personnel as of last pay period in the month. Includes commissioned officer personnel as of last day of month.

Pay - Includes totals of all payrolls covering periods ending during the month: supplemental and final payrolls for previous months processed during the current month.

TABLE XIII

MCWA Expenditures and Liquidations by Major Items

MAY 1946

	CONTINENTAL U. S.	PERCENTAGE OF TOTAL	PUERTO RICO	PERCENTAGE OF TOTAL
01 Personal Services	$580,822.00	79.62	$14,165.00	91.18
02 Travel	56,081.04	7.69	317.15	2.04
03 Transportation of Things	9,455.83	1.30	---	---
04 Communication Services	1,260.41	0.17	17.71	0.12
05 Rent and Utility Services	4,413.35	0.60	---	---
06 Printing and Binding	2,570.60	0.35	---	---
07 Other Contractual Services	12,388.54	1.70	11.00	0.07
08 Supplies and Materials	50,540.30	6.93	1,024.17	6.59
09 Equipment	11,991.21	1.64	---	---
10 Land and Buildings	---	---	---	---
11 Grants, Subsidies, and Contributions	---	---	---	---
TOTAL	$729,523.28	100.00	$15,535.03	100.00
Expenditures Other Than Personal Services	$148,701.28	20.38	$ 1,370.03	8.82

TABLE XIV

Typhus Expenditures and Liquidations by Major Items

MAY 1946

	CONTINENTAL U. S.	PERCENTAGE OF TOTAL	PUERTO RICO	PERCENTAGE OF TOTAL
01 Personal Services	$87,769.00	112.02	$652.00	100.00
02 Travel	---	---	---	---
03 Transportation of Things	488.00	0.62	---	---
04 Communication Services	5.25	0.01	---	---
05 Rent and Utility Services	68.45	0.09	---	---
06 Printing and Binding	---	---	---	---
07 Other Contractual Services	1,329.33	1.69	---	---
08 Supplies and Material	22,950.29	29.29	---	---
09 Equipment	34,257.29	43.72	---	---
10 Land and Buildings	---	---	---	---
TOTAL	$78,353.03	100.00	$652.00	100.00
Expenditures Other Than Personal Services	$ 9,415.97	12.02	---	---

TABLE XV

Typhus Payroll and Personnel Report

MAY 1946

AREA	COMMISSIONED		PROF. & SCI.		SUB-PROF.		C. A. F.		CUSTODIAL AND PER HOUR		PER DIEM AND PER HOUR		TEMPORARY		TOTAL		PERCENT OF TOTAL	
	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY	NO.	PAY
Alabama	---	---	1	229	9	1,522	---	---	18	2,232	---	---	19	2,586	47	6,569	9.81	7.43
Arkansas	---	---	1	288	1	235	---	---	---	---	---	---	2	255	4	478	0.83	0.88
Florida	---	---	1	331	11	1,740	---	---	1	121	---	---	6	863	19	3,055	3.97	3.45
Georgia	6	2,170	6	1,791	35	6,406	1	151	1	121	---	---	27	4,185	76	14,824	15.87	16.76
Louisiana	---	---	1	229	18	3,873	---	---	---	---	---	---	16	2,552	35	6,654	7.31	7.53
Mississippi	---	---	1	594	1	1,401	---	---	---	867	---	---	---	380	2	3,242	0.42	3.67
North Carolina	2	570	1	57	2	438	1	146	---	298	---	---	18	2,554	24	4,063	5.01	4.59
South Carolina	---	---	2	764	12	3,491	---	---	8	1,466	---	---	11	2,211	33	7,932	6.89	8.97
Texas	---	---	5	1,541	54	12,237	2	293	7	1,052	---	---	21	4,612	89	19,735	18.58	22.32
Tennessee	---	---	---	---	1	162	---	---	6	447	---	---	9	1,009	16	1,618	3.34	1.83
Virginia	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Headquarters	11	3,753	1	870	43	5,918	3	439	11	1,926	---	---	60	5,465	129	18,371	26.93	20.78
Puerto Rico	---	---	1	652	---	---	---	---	---	---	---	---	---	---	1	652	0.21	0.74
Savannah Unit, Ga.	1	343	1	280	1	162	---	---	---	---	---	---	1	143	4	928	0.83	1.05
Total	20	6,836	22	7,626	188	37,585	7	1,029	52	8,530	---	---	190	26,815	479	88,421	100.00	100.00
Percent of Total	4.17	7.73	4.59	8.62	39.25	42.51	1.46	1.16	10.86	9.65	---	---	39.67	30.33	100.00	100.00		

NOTE: No. - Includes civilian personnel as of last pay period in the month. Includes commissioned officer personnel as of last day of month.
Pay - Includes totals of all payrolls covering periods ending during the month; supplemental and final payrolls for pervious months processed during the current month.