Communicable Disease Center

FEDERAL SECURITY AGENCY
U. S. PUBLIC HEALTH SERVICE
ATLANTA, GEORGIA

COMMUNICABLE DISEASE CENTER

Organization and Services

For more detailed information regarding the services offered by the divisions of the Communicable Disease Center, address inquiries to the Medical Officer in Charge, Communicable Disease Center, 605 Volunteer Building, Atlanta, Georgia — Attention: chief of the particular division concerned.

FOREWORD

On July 1, 1946, the USPHS Communicable Disease Center was inaugurated officially in Atlanta, utilizing the established facilities of the Office of Malaria Control in War Areas. The Center continues certain operational, training, and investigational activities of the former organization. In addition, it provides special facilities for the prevention of communicable disease not previously available as federal services and which are beyond the resources of the individual states. The Center transmutes scientific facts about communicable disease into practical methods of control, promotes their utilization by demonstrating improved techniques, and trains health personnel in their field application.

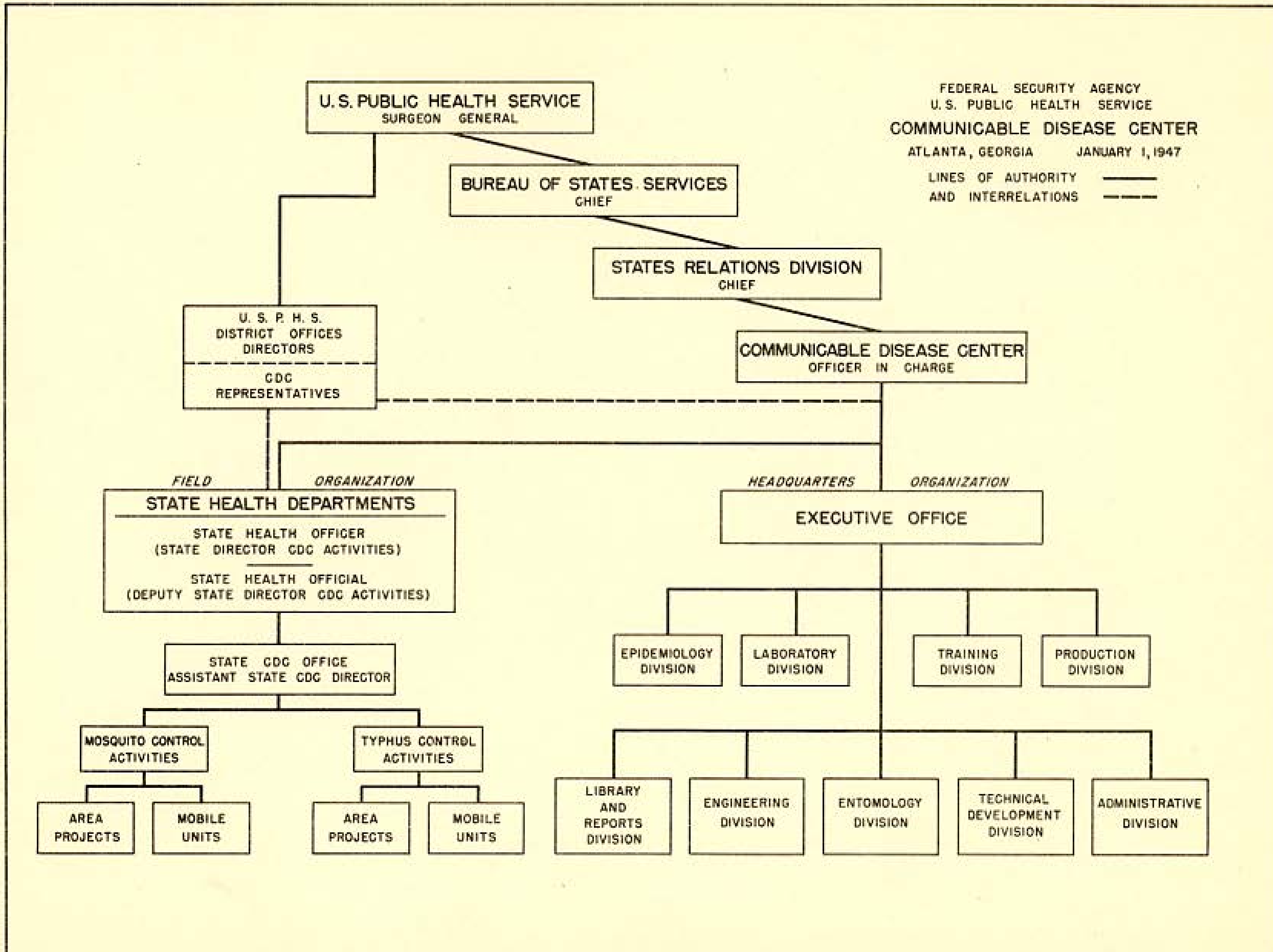
The group of diseases with which the Center is most concerned at present is characterized by the knowledge or suspicion that its causative agents, transmitters, or reservoirs of infection are zoological. It includes malaria, amoebiasis, the schistosomiases, hookworm disease, filariasis, yellow fever, dengue, certain neuro-virologic disorders such as poliomyelitis and encephalitis, the various forms of typhus and plague, sandfly fever, diverse diarrheas and dysenteries, and related diseases. This consolidation is clinically heterogeneous, but from the standpoints of laboratory diagnosis, epidemiologic investigation, and control operation it is eminently sound, sensible, and workable.

To prevent the introduction into or the extension within this country of certain of the disorders or their varient strains listed above, the united efforts of the physician, the sanitary engineer and the public health biologist must be coordinated in a joint program of technologic development, field application, and evaluation and dissemination of the new knowledge and improved health practices.

To conduct under a single administrative entity such multi-purpose programs covering a broad group of diseases permits almost limitless interchangeability and combinations of professional skills and related disciplines. This combines maximal efficiency with a minimum of personnel, thus effecting significant and far-reaching economies. On the pages which follow, information is set forth to show how this is being accomplished.

R. A. Vonderlehr
Medical Director in Charge

April 8, 1947


FEDERAL SECURITY AGENCY
U. S. PUBLIC HEALTH SERVICE
COMMUNICABLE DISEASE CENTER
ATLANTA, GEORGIA JANUARY 1, 1947
LINES OF AUTHORITY
AND INTERRELATIONS
U. S. PUBLIC HEALTH SERVICE
SURGEON GENERAL
BUREAU OF STATES SERVICES
CHIEF
STATES RELATIONS DIVISION
CHIEF
COMMUNICABLE DISEASE CENTER
OFFICER IN CHARGE
U. S. P. H. S.
DISTRICT OFFICES
DIRECTORS
CDC
REPRESENTATIVES
FIELD ORGANIZATION
STATE HEALTH DEPARTMENTS
STATE HEALTH OFFICER
(STATE DIRECTOR CDC ACTIVITIES)
STATE HEALTH OFFICIAL
(DEPUTY STATE DIRECTOR CDC ACTIVITIES)
STATE CDC OFFICE
ASSISTANT STATE CDC DIRECTOR
MOSQUITO CONTROL
ACTIVITIES
TYPHUS CONTROL
ACTIVITIES
AREA
PROJECTS
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HEADQUARTERS ORGANIZATION
EXECUTIVE OFFICE
EPIDEMIOLOGY
DIVISION
LABORATORY
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TRAINING
DIVISION
PRODUCTION
DIVISION
LIBRARY
AND
REPORTS
DIVISION
ENGINEERING
DIVISION
ENTOMOLOGY
DIVISION
TECHNICAL
DEVELOPMENT
DIVISION
ADMINISTRATIVE
DIVISION

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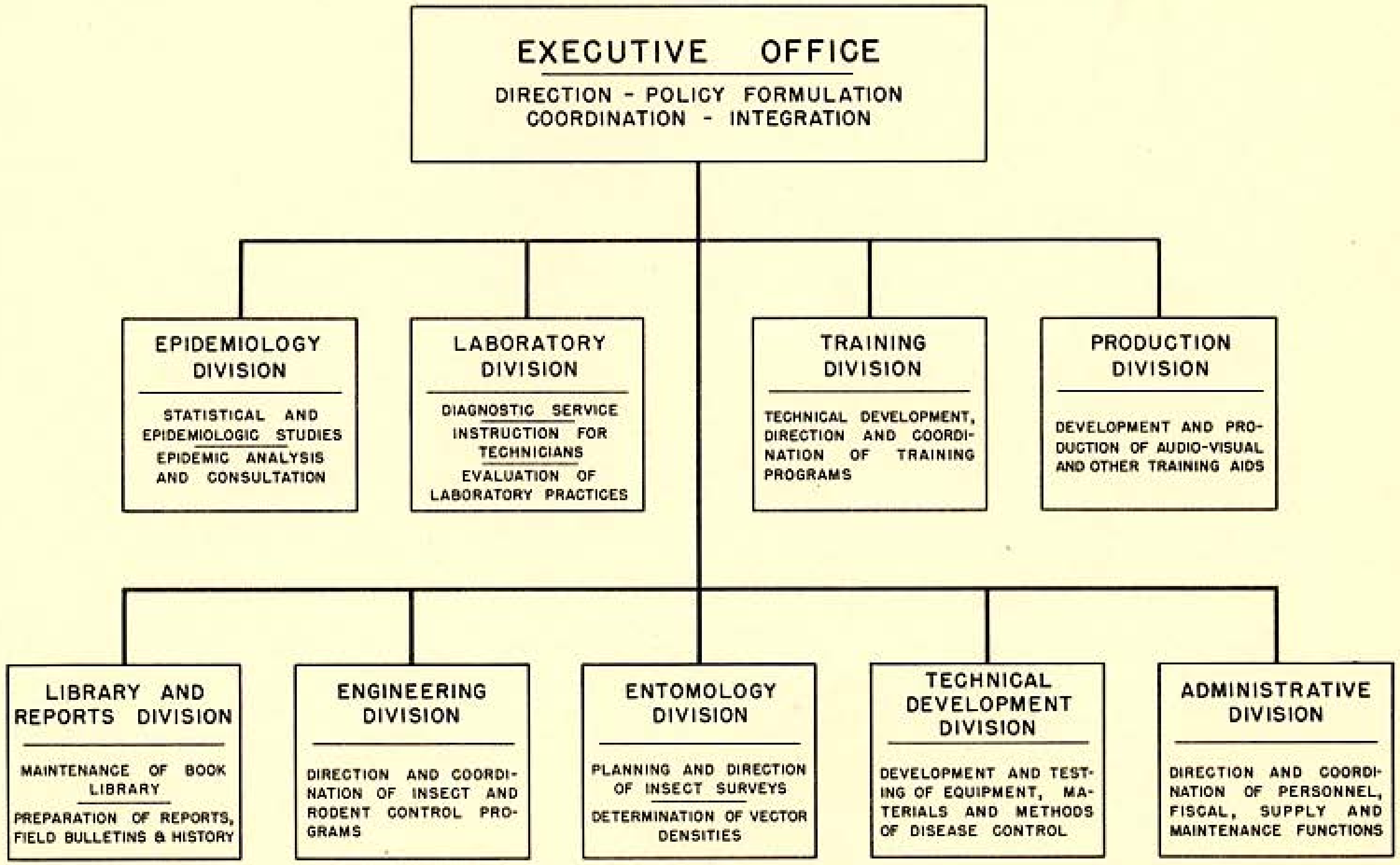
COMMUNICABLE DISEASE CENTER

CHART SHOWING STRUCTURE AND FUNCTIONS
OF HEADQUARTERS ORGANIZATION



FEDERAL SECURITY AGENCY - U. S. PUBLIC HEALTH SERVICE

COMMUNICABLE DISEASE CENTER - ATLANTA, GEORGIA

1-14-47

FUNCTIONAL DIVISIONS

of the

COMMUNICABLE DISEASE CENTER

EPIDEMIOLOGY DIVISION

SELECTION OF AREAS OF COMMUNICABLE DISEASE CONTROL OPERATIONS; EVALUATION OF CONTROL PROCEDURES; EPIDEMIOLOGIC AID TO STATES.

STATISTICAL BRANCH

MAINTAINS MORTALITY AND MORBIDITY RECORDS OF COMMUNICABLE DISEASES; PROVIDES STATISTICAL SERVICE TO DIVISIONS OF CDC, STATE AND LOCAL HEALTH DEPARTMENTS, AND OTHER FEDERAL AGENCIES AND PRIVATE INSTITUTIONS CONCERNED WITH PUBLIC HEALTH.

VIRUS BRANCH

(Montgomery, Alabama)

STUDIES THE RELATIONSHIP BETWEEN VECTORS AND HOST-RESERVOIRS IN TRANSMISSION OF NEUROTROPIC VIRUS DISEASES.

MALARIA BRANCH

(Manning, South Carolina)

EVALUATES EFFECTIVENESS OF DDT RESIDUAL SPRAYING ON MALARIA IN THE FIELD.

TYPHUS BRANCH

(Thomasville, Georgia)

EVALUATES THE EFFECTIVENESS OF DDT DUSTING ON MURINE TYPHUS FEVER IN THE FIELD.

EPIDEMIOLOGY DIVISION

The Epidemiology Division selects areas of operations by determining, through morbidity and mortality statistics, where malaria, typhus, polio, and other communicable diseases occur; recommends control measures; and evaluates the effectiveness of control procedures in terms of decrease of human cases and deaths from the diseases concerned. This division also offers epidemic aid to states, upon request, by providing teams of trained scientists skilled in epidemic control.

The Statistical Branch of this division keeps complete morbidity and mortality records on communicable diseases, not only in areas under control, but also in other areas of the United States. These records indicate that while typhus fever cases have decreased in areas under control, there has been a slight increase in the rest of the nation; also that malaria has decreased during the time control measures have been in progress. This branch also provides statistical service to other divisions of CDC.

The other three branches of the division are concerned with field investigation of malaria, typhus, and virus diseases such as polio.

FIELD INVESTIGATIONS

Malaria Field Studies - The Malaria Branch is conducting field studies at Manning, South Carolina, in cooperation with the South Carolina State Board of Health, to determine the efficacy of DDT residual spray in preventing the transmission of human malaria, and to observe theepidemiology of malaria in an endemic area.

Typhus Investigations - The Typhus Branch is carrying on a controlled field attempt to determine the effectiveness of DDT dusting on murine typhus fever. This project, encompassing several counties in south Georgia, operates out of Thomasville, Ga.

Fly-Polio Studies - The Virus Branch, at Montgomery, Alabama, is attempting to discover by field studies the role of flies (and other possible arthropods) as vectors of polio, and the host-reservoirs of this neurotropic virus. All aspects of polio are being considered in this study.

LABORATORY DIVISION

DIAGNOSTIC LABORATORY SERVICES, INSTRUCTION FOR LABORATORY TECHNICIANS, EVALUATION OF LABORATORY PRACTICES, AND LABORATORY EPIDEMIC AID IN RELATION TO THE COMMUNICABLE DISEASES AND THEIR VECTORS.

STATE AID BRANCH

SURVEY AND EVALUATION OF PUBLIC HEALTH LABORATORIES CONCERNED WITH COMMUNICABLE DISEASES; CONSULTATION AND INSTRUCTION ON LABORATORY PROBLEMS; FURNISHING DIAGNOSTIC SLIDES AND OTHER TRAINING MATERIAL TO PUBLIC HEALTH LABORATORIES.

VIROLOGY BRANCH

ORGANIZATION AND DIRECTION OF NEUROTROPIC VIRUS AND RICKETTSIA IDENTIFICATION SERVICE; ANIMAL INOCULATION, NEUTRALIZATION TESTS, AND SEROLOGICAL EXAMINATION; DEVELOPMENT OF NEW METHODS OF VIRUS IDENTIFICATION; LABORATORY AID FOR EPIDEMICS; EVALUATION OF COMMERCIAL RABIES VACCINES; RESEARCH CONCERNED WITH DIAGNOSIS AND CONTROL OF VIRUS DISEASES.

PARASITOLOGY BRANCH

IDENTIFICATION OF PROTOZOAN, HELMINTHIC, AND MEDICALLY IMPORTANT ARTHROPOD SPECIMENS; PARASITE SURVEYS; TRAINING OF TECHNICIANS IN PARASITOLOGY; RESEARCH CONCERNED WITH DIAGNOSIS AND CONTROL OF PARASITIC DISEASES HOST-PREFERENCE SEROLOGY AND PARASITE IMMUNOLOGICAL STUDIES.

BACTERIOLOGY BRANCH

LABORATORY RESEARCH, DIAGNOSIS, AND ASSISTANCE IN BACTERIOLOGY AND SEROLOGY TO SUPPORT EPIDEMIOLOGICAL INVESTIGATION; COMPLEMENT-FIXATION AGGLUTINATIONS AND WEIL-FELIX INCIDENCE; IDENTIFICATION OF BACTERIOLOGIC SPECIMENS; EVALUATION OF BACTERIOLOGY LABORATORY PROCEDURES, INCLUDING THOSE RELATED TO TUBERCULOSIS, MYCOLOGIC, AND SIMILAR PATHOLOGICAL CONDITIONS; EVALUATION OF SENSITIVITY AND SPECIFICITY OF CLINICO-PATHOLOGICAL PROCEDURES.

LABORATORY DIVISION

The Laboratory Division offers basic laboratory services to other divisions of CDC, and a number of other services to state and local health departments. The research conducted by the Laboratory Division is directed toward application of fundamental scientific information to practical diagnostic problems concerning public health laboratories.

The work of the division is carried on by four functional units:

The major responsibility of the Parasitology Branch is instructional in nature. A series of courses are given in the laboratory diagnosis of parasitic diseases for all grades of public health laboratory personnel and for laboratory directors, and practice diagnostic materials are distributed to laboratories throughout the United States. (Recruitment for these courses is handled by the Training Division.) As part of its reference diagnostic service, the laboratory receives specimens (fecal, blood, urine, tissue, etc.) from state and local laboratories and checks them for protozoan and helminthic parasites. An identification service is also offered for medically important arthropods. This branch aids state and local laboratories having problems concerning diagnostic techniques for parasitic diseases by laboratory investigation and evaluation. In investigations of epidemiological problems confronting state and local health departments, the Parasitology Branch sends teams of trained parasitologists into the field to offer on-the-spot laboratory assistance (sometimes in collaboration with the Epidemiology Division.)

The Virus Branch engages in the laboratory diagnosis of neurotropic viruses. Identification or isolation of virus etiological agents are made by animal and egg inoculations, chicken red blood cell agglutinations, and neutralization tests. Rickettsial diseases are studied serologically. The virus identification service offers assistance in the laboratory diagnosis of polio, the various encephalitides, influenza, and rabies. Serological diagnosis includes the Weil-Felix reaction and complement-fixation tests for Rocky Mountain spotted fever, typhus, and Q fever. Also, surveys are being conducted by this branch on the incidence of typhus in rat and human blood.

The State Aids Branch is concerned with offering training materials and consultation services to state and local health department laboratories. Monthly shipments of parasitological specimens are sent, together with keys to the correct diagnosis. At intervals, test sets of malaria blood films are also sent to participating laboratories. Consultation service is available in planning, equipping, and staffing new laboratories, as well as for technical problems which arise in the operation of existing laboratories. Trained personnel survey and evaluate the technical procedures, administrative methods, and equipment employed by any public health laboratory.

The Tuberculosis Laboratory, now being equipped, offers assistance in specimen identification or research problems related to the laboratory diagnosis of tuberculosis. The Bacteriology Branch, with major sections devoted to mycology and pathology, is now being organized. This branch will give major attention to determining the sensitivity and specificity of laboratory bacteriological methods. To a limited degree, the Laboratory Division is already offering bacteriological services in the form of laboratory assistance during epidemics, and consultation services.

SUBMITTING OF SPECIMENS

The service of identification of specimens is not intended to compete with other established laboratories, but rather to render aid with difficult laboratory problems. Specimens are not solicited, but when other public health laboratories have difficulty with their results, or do not have the equipment for specific examinations, this division will assist when possible. For best diagnostic results, specimens should be prepared for submission according to the following instructions:

Virus Examinations - For isolation of neurotropic viruses, specimens should be frozen immediately with dry ice and shipped via air mail to the Virus Laboratory, U. S. Public Health Service, Box 436, Rt. 3, Federal Drive, Montgomery, Alabama. For serological tests, whole blood is satisfactory. However, it is best to submit serum specimens that have been obtained by sterile techniques. There is no need to add a preservative, or to refrigerate, but the specimens should be sent via air mail to the Virus Laboratory at the above address.

Rickettsial Examinations - At present, the rickettsias are not isolated, but the specific diseases are identified through the immunologic reactions of the blood. Specimens should be submitted as indicated above for virus serological tests.

Parasitological Examination of Fecal Specimens - If fecal specimens cannot be submitted within a few hours, they should be preserved with 10% formalin and mailed in a suitable container. There is no need to send dysenteric or diarrheic stools by mail inasmuch as the etiological agent (trophs of *Endamoeba histolytica*) will disintegrate or become unrecognizable before arrival. Fecal specimens should be addressed - Attention: Parasitology Branch, 291 Peachtree Street, Atlanta, Georgia.

Parasitological Examination of Blood Specimens - In general, blood suspected of containing malarial parasites, microfilariae, or other blood parasites should be submitted as thin and thick blood films stained with a Romanovsky's solution. Unstained films may also be submitted provided they arrive within a few days after they are made. Upon request, additional information will be given on methods of submitting whole blood for examination of blood parasites other than malaria. Specimens should be addressed - Attention: Parasitology Branch, at the above address.

Arthropod Examinations - Specimens of insect larvae, ticks, bedbugs, lice, spiders, scorpions, and other hard-shelled arthropods should be shipped in vials containing 70% alcohol. Specimens of flies, mosquitoes, and other fragile insects should be sent dry between layers of lens paper or some soft cleansing tissue (not absorbent cotton) in pill boxes or other small containers. These specimens should be addressed - Attention: Parasitology Branch, at the above address.

Bacteriological Examinations - Materials suspected of containing pathogenic bacteria should be inoculated on a suitable medium and sent via air mail, Attention: Bacteriology Branch, 291 Peachtree Street, Atlanta, Georgia.

TRAINING DIVISION

GENERAL ADMINISTRATION AND COORDINATION OF ALL ESTABLISHED CDC TRAINING ACTIVITIES; EVALUATION OF TRAINING PROGRAMS; PLANNING AND DEVELOPMENT OF NEW PROGRAMS; LIAISON WITH PROFESSIONAL ASSOCIATIONS, EDUCATIONAL INSTITUTIONS, AND OTHER ORGANIZATIONS CONCERNED WITH TRAINING AND EDUCATION; ACCREDITATION OF TRAINING PROGRAMS; COOPERATION WITH DIVISION OF COMMISSIONED OFFICERS IN ORIENTATION PROGRAMS; RECRUITMENT OF TRAINEES; COORDINATION OF ASSISTANCE IN PRODUCTION OF AUDIO-VISUAL AIDS; PROFESSIONAL ASSISTANCE TO OTHER FEDERAL AGENCIES AND STATE AND LOCAL HEALTH DEPARTMENTS IN FIELD TRAINING ACTIVITIES.

ADMINISTRATIVE BRANCH

PERSONNEL MANAGEMENT; PROCUREMENT OF SUPPLIES AND EQUIPMENT; DISTRIBUTION OF TRAINING AND OTHER LITERATURE; INSTRUCTION OF OFFICE PERSONNEL; BUDGET AND FISCAL ACTIVITES; LIAISON WITH PROFESSIONAL PERSONNEL.

FILM LIBRARY BRANCH

PROCUREMENT AND DISTRIBUTION OF AUDIO-VISUAL AIDS, INCLUDING PROJECTION EQUIPMENT; INSTRUCTION IN USE OF PROJECTION EQUIPMENT; COORDINATION OF UTILIZATION OF CDC PROJECTION ROOM.

INSECT AND RODENT CONTROL BRANCH

ADMINISTRATION OF INSECT AND RODENT CONTROL FIELD TRAINING PROGRAMS; ADMINISTRATION AND COORDINATION OF FOREIGN TRAINEE FIELD TRAINING PROGRAMS; PREPARATION OF MANUALS AND INSECT SPECIMENS FOR TRAINING PURPOSES; ASSISTANCE TO STATES IN CONDUCTING SPECIAL FIELD TRAINING PROGRAMS; INTEGRATION OF ACTIVITIES WITH SANITARY ENGINEERING AND SANITATION FIELD TRAINING.

PUBLIC HEALTH TRAINING STATION

(Columbus, Georgia)

SANITARY ENGINEERING FIELD TRAINING; ADVANCED SANITATION FIELD TRAINING; IN COOPERATION WITH COLUMBUS-MUSCOGEE COUNTY HEALTH DEPARTMENT AND GEORGIA DEPARTMENT OF PUBLIC HEALTH.

SAVANNAH FIELD TRAINING STATION

(Savannah, Georgia)

HEALTH EDUCATION FIELD TRAINING; PUBLIC HEALTH NURSE ORIENTATION; HEALTH DEPARTMENT RECORDS TRAINING; PRIMARY SANITATION FIELD TRAINING IN COOPERATION WITH SAVANNAH-CHATHAM COUNTY HEALTH DEPARTMENT AND GEORGIA DEPARTMENT OF PUBLIC HEALTH.

TOPEKA FIELD TRAINING CENTER

(Topeka, Kansas)

MID-WEST SANITATION FIELD TRAINING; IN COORPERATION WITH TOPEKA-SHAWNEE COUNTY HEALTH DEPARTMENT, KANSAS STATE BOARD OF HEALTH, UNIVERSITY OF KANSAS, AND USPHS DISTRICT NO. 7 OFFICE.

ALBANY-DOUGHERTY COUNTY FIELD TRAINING AREA

INSECT VECTOR CONTROL FIELD TRAINING, FIELD TRAINING IN ENVIROMENTAL SANITATION CONTROL PROCEDURES FOR FOREIGN TRAINEES; INTEGRATION WITH SANITARY ENGINEERING AND SANITATION FIELD TRAINING IN COOPERATION WITH ALBANY-DOUGHERTY COUNTY HEALTH DEPARTMENT, GEORGIA DEPARTMENT OF PUBLIC HEALTH, AND EMORY UNIVERSITY FIELD STATION.

TRAINING DIVISION

The Training Division has developed 15 practical field training programs in the various phases of public health methods and communicable disease control. These programs are open to personnel of federal, state, and local health departments, foreign trainees, and to certain private institutions.

The list of programs includes:

- Sanitary Engineer Field Training - 12 weeks
- Advanced Sanitation Field Training - 12 weeks
- Primary Sanitation Field Training - 12 weeks
- Mid-west Sanitation Field Training - 12 weeks
- Field Training in Environmental Control Procedures for Foreign Trainees - 4 weeks
- Evaluation of DDT Dusting in Murine Typhus Control - 1 week
- Rodent-borne Disease Control - 6 weeks
- Control of Malaria and Other Mosquito-borne Disease - 4 weeks
- Fly and Insect Control - 2 weeks
- Mobile DDT Demonstrations - 3-day periods
- Practical Health Department Records Training - 8 weeks
- Laboratory Diagnosis of Parasitic Diseases - 6 weeks
- Laboratory Diagnosis of Parasitic Diseases for Senior Laboratory Staff Members and Directors - 2 weeks
- Public Health Education Field Training - 12 weeks
- Industrial Hygiene Field Training - 12 weeks

Five field training areas are utilized: Atlanta, Savannah, Columbus, and Albany, Georgia; and Topeka, Kansas. Detailed schedules of each training program, including eligibility requirements and method of application, are available upon request.

The Training Division is especially anxious to emphasize the practical nature of these field training programs. They are designed to supplement the academic work of educational institutions with properly correlated field training and a minimum of competitive classroom work. Under the close supervision of the U. S. Public Health Service staff, the trainees work in the field as members of a local health department. The division maintains evaluation procedures and sufficient records to develop a pattern for field training programs for all types of public health personnel. In this way, the division is able to assist states which conduct field training programs through consultation, temporary assignment of personnel, and the supplying of necessary printed and audio-visual training material and equipment.

Special provision is made for foreign trainees who are studying in the United States under the auspices of the Rockefeller Foundation, the Institute of Inter-American Affairs, the International Health Relations Division of the U. S. Public Health Service, and other agencies. Field training in environmental control procedures for these foreign trainees includes malaria control, insect control, and basic sanitation.

A film library has been established in the Training Division, where several hundred film strips and motion pictures are available to the field training stations. Audio-visual training material on public health subjects dealing with communicable diseases is also available for loan without cost to medical schools, schools of public health, universities, and other field training stations. A film catalog will be sent upon request.

The Training Division has undertaken to provide facilities for field training of public health workers associated with the control of communicable diseases. Plans are being developed to provide field training opportunities for health officers, graduate public health nurses, and other types of public health personnel as satisfactory training areas and training staff personnel become available.

PRODUCTION DIVISION

SUPERVISION AND DIRECTION OF THE STORY DEVELOPMENT, PRODUCTION, AND UTILIZATION BRANCHES IN THE MAKING OF SOUND TRAINING FILMS, FILM STRIPS, AND OTHER AUDIO-VISUAL AIDS TO TRAIN TECHNICAL AND PROFESSIONAL PUBLIC HEALTH PERSONNEL IN COMMUNICABLE DISEASE INVESTIGATION AND CONTROL.

STORY DEVELOPMENT BRANCH

PLANNING, DEVELOPMENT, AND WRITING OF SCRIPTS WITH ASSISTANCE OF TECHNICAL ADVISERS, AND SUPERVISION OF FILMS AND FILM SCRIPTS THROUGH ALL STAGES OF PRODUCTION.

PRODUCTION BRANCH

SUPERVISION AND COORDINATION OF ALL DEPARTMENTS HANDLING PHYSICAL PRODUCTION OF AUDIO-VISUAL AIDS; PHOTOGRAPHY, CUTTING AND EDITING, SPECIAL EFFECTS, AND NARRATION RECORDING OF SOUND MOTION PICTURES AND FILM STRIPS; ART WORK, SIMPLE MINIATURE CONSTRUCTION, TITLES, AND ANIMATION NECESSARY TO SUPPLEMENT LIVE-ACTION PHOTOGRAPHY; PROCESSING OF MOTION PICTURES, FILM STRIPS, AND PHOTOGRAPHIC STILLS.

UTILIZATION BRANCH

PROMOTION OF PROGRAM OF EFFECTIVE UTILIZATION AND EVALUATION OF AUDIO-VISUAL AIDS BY MAINTAINING LIAISON WITH TECHNICAL PERSONNEL IN PUBLIC HEALTH TRAINING PROGRAMS; EVALUATION OF EFFECTIVENESS AND CONSTRUCTIVE CRITICISM OF AUDIO-VISUAL AIDS PRODUCED BY PRODUCTION DIVISION; PREPARATION OF ILLUSTRATED MANUALS FOR INSTRUCTORS TO ACCOMPANY AUDIO-VISUAL AIDS.

PRODUCTION DIVISION

The Production Division is a service unit, designed to produce technical and professional audio-visual aids for the training and operational units of the Communicable Disease Center, as well as for other professional agencies engaged in public health training.

Sound motion pictures and film strips, slide films, still photographs, and illustrations for CDC publications comprise the audio-visual media produced. Display material and consultation service for public health exhibits are also provided by the division.

The functions of the division are carried out by three branches:

The Story Development Branch plans all productions, and assigns project supervisors to direct the preparation, development, and over-all production of motion pictures and film strips, working in conjunction with technical advisers and writers.

The Production Branch handles all physical production, such as photography, cutting and editing, art work and miniature set construction, recording, and laboratory processing.

The Utilization Branch promotes a program for the effective use of all audio-visuals by maintaining liaison with technical personnel in public health training. The Evaluation Section of this Branch conducts evaluation surveys of utilization and film content.

The division develops training aids for use in schools of public health and sanitary engineering, produces documentary films on various CDC operational projects, and supplies technical assistance in the production of research films. Services are provided by the division for evaluating films produced by other organizations in the various fields of interest to CDC. The division seeks to stimulate interest in better teaching methods through workshops, field utilization programs, and evaluation surveys. An attempt is made to place visual aid materials in the hands of those in a position to use them in curricula, and to initiate and promote effective utilization programs. The division also seeks to advance the use of visual aid materials through governmental and national collaborative movements.

In the long-range training program in the field of preventive medicine being undertaken cooperatively by the Emory University School of Medicine and CDC, the Production Division plans to support a demonstration-teaching project, employing visual aids with special reference to preventive medicine in the control of the communicable diseases. The ultimate objective of the demonstration is the increased use of audio-visual aids in schools of medicine and hygiene in this country and abroad, and the promoting of a better understanding of public health among new practitioners. For technical guidance in these efforts, the division has enlisted the cooperation of the Association of Professors of Preventive Medicine.

The Production Division produces motion pictures and film strips at the request of other divisions of the U. S. Public Health Service, state and local health departments, medical and public health schools, and, in some cases, foreign governments (through the State Department) if justification is sufficient to warrant the cost of production. The division is also able to produce motion pictures, film strips, still photographs, and slides, involving specialized interests in the field of public health, on request, where arrangements can be made for a transfer of funds to cover the costs involved. Production is limited to the technical field only. The division does not undertake work in the field of lay education.

LIBRARY AND REPORTS DIVISION

PREPARATION OF REPORTS, CDC BULLETIN, HISTORY OF CDC, HANDBOOKS, MANUALS, ETC.; CLEARANCE OF MANUSCRIPTS FOR PRESENTATION OR PUBLICATION; EDITORIAL SERVICES; REFERENCE LIBRARY.

LIBRARY BRANCH

MAINTAINS A REFERENCE COLLECTION OF BOOKS AND PERIODICALS RELATED TO INFECTIOUS DISEASES AND THEIR CONTROL.

EDITORIAL BRANCH

PREPARES REPORTS, CDC BULLETIN, HISTORY, MANUALS, HANDBOOKS, ETC.; CLEARS MANUSCRIPTS; EDITORIAL SERVICES; TYPOGRAPHY, VARI-TYPING, "LAY-OUT".

LIBRARY and REPORTS DIVISION

One of the by-products of accomplishment is the experience - the know-how - gained from its achievement. Present-day accomplishments are based upon the experiences of the past, just as future accomplishments will be based on present experiences. It is the function of the Library and Reports Division to maintain records of past accomplishments and experiences through the medium of a reference library, and to record current achievements and experiences for future reference through the medium of an editorial (reports) branch.

THE EDITORIAL BRANCH. The diversified functions of the editorial branch fall into three general categories: (1) reporting of accomplishments; (2) editorial services to the Communicable Disease Center; and (3) the preparation of printed training aids used in the training and operational programs of CDC.

Under the heading of reporting, the editorial branch prepares for publication each fiscal year's annual report, which consists of a detailed, illustrated account of the operations of the headquarters and field offices in regard to activities of epidemiologic, entomologic, engineering, diagnostic, training, and investigative nature. The annual report also includes an account of CDC programs in each state having such a program. As a corollary to these annual reports, the editorial branch is now preparing an all-inclusive "History of Malaria Control in War Areas," to cover the years 1942-1946. To keep headquarters and field personnel informed of current activities of CDC, the editorial branch prepares the quarterly "CDC Bulletin," which contains technical and informative feature articles, personnel items, statistics of operations, headquarters and field program notes, and other current information. Other types of reports are prepared by the editorial branch at the request of the other divisions of CDC.

Editorial services to the divisions of CDC vary all the way from minor editing to actual writing of articles, reports, guides, and the like. One job of increasing importance is the review and clearance (through the Division of Public Health Methods) of all manuscripts written by CDC personnel either for presentation at meetings or for publication in scientific or technical journals. A complete, cross-indexed file of these manuscripts is maintained for reference purposes. The editorial branch is frequently consulted by other divisions in the preparation of manuscripts, manuals, course outlines, catalogues, etc. Personnel of the division write scripts or act as technical advisors for films and film strips produced as part of CDC professional and technical services, and in some cases a member of the division serves as the project supervisor, with the responsibility of supervising the actual production of films and film strips. The division also cooperates with other federal departments, state and local health departments, and private institutions and professional persons interested in public health in furnishing information concerning communicable diseases and their control. All printed materials released by CDC are edited, marked for typography, illustrated, "vari-typed," "laid-out," and delivered to the printers by the editorial branch.

The third category, printed training aids, includes the preparation of manuals and handbooks for professional and technical field personnel, manuals to accompany films and film strips, and, rarely, publications for lay groups, where such information is necessary to carry out operational programs. Representative titles of these publications include: "Larviciding," "Drainage Maintenance," "DDT for the Control of Murine Typhus Fever," "DDT Residual Spray Operations," "Entomological Field Handbook," "Identification of Female Anophelines of the United States," "The Organization and Fuctions of the U. S. Public Health Service," and "DDT for Control of Household Insects Affecting Health." Various posters, pamphlets, and throw-aways have been produced in several languages for use in connection with such operational programs as malaria and typhus control.

THE LIBRARY. The library contains basic reference or source books in the various sciences related to infectious disease control and a comprehensive collection of the current periodicals in the fields related to infectious disease. The library is used both by headquarters personnel and students attending the various CDC training courses. An exchange service has been worked out with the National Institute of Health, and colleges, universities, and medical schools in Atlanta and vicinity to supply requested reference materials not possessed by the CDC library. The library's resources are made available on a short or long term loan basis to other departments, institutions, and individuals interested in public health.

At the present time, the library contains approximately 3,000 books and periodicals. Future plans include the acquisition of 30,000 volumes, an abstracting service for any employee of CDC, and an expansion of functions to include those services offered elsewhere only by the library of the London School of Hygiene and Tropical Medicine.

ENGINEERING DIVISION

DIRECTION AND COORDINATION OF THE OPERATION OF THE INSECT AND RODENT CONTROL PROGRAMS RELATED TO COMMUNICABLE DISEASES

MOSQUITO CONTROL BRANCH

OPERATION OF MOSQUITO CONTROL PROGRAMS IN COOPERATION WITH STATE HEALTH DEPARTMENTS; CONSULTANT SERVICE IN GENERAL INSECT CONTROL OPERATIONS.

TYPHUS CONTROL BRANCH

OPERATION OF THE TYPHUS CONTROL PROGRAM IN COOPERATION WITH STATE HEALTH DEPARTMENTS IN AREAS APPROVED BY REASON OF SUFFICIENTLY HIGH ENDEMICITY OF THE DISEASE.

EQUIPMENT AND CONSTRUCTION BRANCH

PROCUREMENT AND DISTRIBUTION OF MATERIALS AND EQUIPMENT FOR OPERATIONAL PROJECTS, AND FOR ALL OTHER ACTIVITIES OF THE COMMUNICABLE DISEASE CENTER.

IMPOUNDED WATER BRANCH

STUDY OF WATER IMPOUNDMENTS FOR DETERMINATION OF MOSQUITO-BORNE HEALTH HAZARDS AND PREPARATION OF RECOMMENDATIONS FOR CONTROL.

ENGINEERING DIVISION

The Engineering Division directs and coordinates the operation of the insect and rodent control programs of the Communicable Disease Center. In general, it makes possible the operation of the malaria and typhus control programs in areas which are judged eligible for such activities by securing the cooperation of state health departments, assigning necessary professional personnel, making available needed materials and equipment, and maintaining equipment in use.

The division is responsible for keeping operation costs at a minimum by conducting continuing analyses of operational data and encouraging economical practices. It must also keep informed of the progress of investigations, and anticipate for field application any newly developed control principles. The supply of available professional personnel is closely checked for the purpose of guiding such personnel toward vacancies in state health department organizations. An important phase of the division's activities is the determination of those federal, state, and local agencies which may benefit by CDC assistance or consultation, and arranging for cooperative procedures to be set up.

Four component branches carry out the activities of the Engineering Division:

The over-all functions of the Mosquito Control Branch include: (1) directing the operation of malaria control programs, consisting of the control of mosquito breeding by minor drainage or larviciding and the control of adult mosquitoes by DDT residual spraying, in cooperation with state health departments in areas where funds are specifically allocated; and (2) providing consultant service in general insect control operation to other divisions of CDC, other federal agencies, state and local health departments, and special investigational projects. This branch also carries on evaluations of methods to secure local participation in cost of operations with the ultimate aim of having such activities as malaria and Aedes aegypti control included as a permanent part of state public health programs. Assistance is given other divisions in the development, improvement, and field testing of equipment for the dispersion of insecticides and larvicides, and, in situations where laboratory facilities cannot readily duplicate all of the variable factors involved in an investigation, this branch secures the incorporation of investigational procedures on selected operating projects.

The Typhus Control Branch directs the operation of the typhus control program, consisting of ratproofing, DDT dusting, rat poisoning, and general sanitation activities, in cooperation with state health departments in areas approved by reason of sufficiently high endemicity of the disease. This branch cooperates with health officials, federal agencies, and private industry in the development of rat control activities, and assists in training programs for rodent control personnel. Direction is given to investigational projects designed to determine methods of more economical and more efficient operations, including the field testing of newly developed rodenticides and insecticides and their application to operational programs. Promotional and consultative service is provided to rat control programs in marginal states where typhus is not highly endemic, and assistance is offered in demonstration projects for plague suppression in areas where plague exists in wild rodents.

This branch also analyzes data from typhus control programs to determine the possible correlation between human and rat typhus prevalence and rat ecto-parasite indices.

The Equipment and Construction Branch is responsible for the procurement and distribution of all materials and equipment for operational projects, and for all other activities of the Communicable Disease Center. It secures information as to material and equipment needs of the malaria and typhus control programs, and arranges for the construction of special equipment. To procure necessary materials and tools, this branch solicits specifications from dealers, manufacturers, or producers. This branch also carries out minor construction activities involved in the changing space needs of the divisions of CDC.

The Impounded Water Branch conducts studies of water impoundments to determine the mosquito-borne health hazards which may result from such impoundments, and makes recommendations for the control, particularly, of malaria and encephalitis. This branch provides consultant service on a reimbursable basis to the Corps of Engineers and other federal agencies in the study of the malaria and encephalitis control problems on existing and proposed impoundments, and submits recommendations covering the factors which should be considered in the design, construction, maintenance, and management of impoundments in order to control the breeding of the vectors of those diseases. Assistance is also given to CDC and other agencies in the mosquito-control training of personnel concerned with the design, construction, and operation of impoundments.

The services available in or through the Engineering Division to operational projects, special projects, state and local health departments, and USPHS district offices include: adequate sampling and testing of materials and equipment delivered in quantity to operational projects to determine conformance to specifications; development of such training aids as may be required in carrying out operational programs; assistance in insect and rodent control directly and through district office representatives to other federal agencies and institutions; detailing of professional engineering personnel to operating programs and special projects; and continuous general supervision over the rate of expenditure of federal funds allocated to states to avoid termination of necessary operations prior to end of fiscal year.

ENTOMOLOGY DIVISION

GENERAL DIRECTION AND PLANNING OF ENTOMOLOGICAL ACTIVITIES ON MALARIA AND TYPHUS CONTROL OPERATIONAL PROGRAMS; ENTOMOLOGICAL SURVEYS; EVALUATION OF CONTROL WORK; FIELD STUDIES AND DEMONSTRATIONS OF INSECT CONTROL METHODS; FIELD SURVEY AND CONSULTATION SERVICE TO OTHER AGENCIES ON GENERAL AND SPECIAL ENTOMOLOGICAL PROBLEMS; PREPARATION AND REVIEW OF REPORTS AND ANALYSES.

MOSQUITO BRANCH

ENTOMOLOGICAL SERVICES ON PROJECTS INVOLVING MOSQUITOES; SURVEY AND EVALUATION OF MALARIA CONTROL OPERATIONAL PROJECTS IN DISTRICTS AND STATES (IN COOPERATION WITH ENGINEERING DIVISION); MALARIA CONTROL FIELD INVESTIGATIONS (IN COOPERATION WITH EPIDEMIOLOGY DIVISION) INCLUDING SUCH PROJECTS AS MANNING, S.C. (IN COOPERATION WITH THE SOUTH CAROLINA STATE BOARD OF HEALTH) AND NEWTON, GEORGIA (IN COOPERATION WITH EMORY UNIVERSITY); SURVEYS OF PROPOSED USED IMPOUNDMENTS (IN COOPERATION WITH ENGINEERING DIVISION); STUDY OF PUBLIC HEALTH PROBLEMS RELATED TO WATER-HYACINTH (IN COOPERATION WITH USED); FIELD INVESTIGATIONS OF ENCEPHALITIS CONTROL (IN COOPERATION WITH HOOPER FOUNDATION, UNIVERSITY OF CALIFORNIA); SURVEYS AND CONSULTATION ON GENERAL MOSQUITO PROBLEMS AS REQUESTED BY HEALTH AGENCIES.

FLY BRANCH

ENTOMOLOGICAL SERVICES ON PROJECTS INVOLVING FLY CONTROL; FIELD INVESTIGATIONS ON FLIES IN RELATION TO DYSENTERY TRANSMISSION (IN COOPERATION WITH NIH AT PHARR, TEXAS); CONSULTATIVE SERVICES ON FLY-POLIO FIELD INVESTIGATIONS (IN COOPERATION WITH EPIDEMIOLOGY DIVISION); SURVEYS AND CONSULTATION ON GENERAL FLY PROBLEMS AS REQUESTED BY HEALTH AGENCIES.

ECTOPARASITE BRANCH

ENTOMOLOGICAL SERVICES ON PROJECTS INVOLVING ANIMAL OR HUMAN ECTOPARASITES; SURVEY AND EVALUATION OF TYPHUS CONTROL OPERATIONAL PROJECTS IN DISTRICTS AND STATES (IN COOPERATION WITH ENGINEERING DIVISION), CONSULTATIVE SERVICES ON TYPHUS CONTROL FIELD INVESTIGATIONS (IN COOPERATION WITH EPIDEMIOLOGY DIVISION) AND ROCKY MOUNTAIN SPOTTED FEVER CONTROL FIELD INVESTIGATIONS (IN COOPERATION WITH GEORGIA DEPARTMENT OF PUBLIC HEALTH); SURVEYS AND CONSULTATION ON GENERAL ECTOPARASITE PROBLEMS AS REQUESTED BY HEALTH AGENCIES.

ENTOMOLOGY DIVISION

The activities of the Entomology Division include field surveys of disease-carrying insects or other arthropods to determine their abundance and the need for control work; recommendations regarding control measures to be used; routine evaluations of the effects of control work in bringing about satisfactory reductions in insect densities; and the determination of the causes for any unsatisfactory results. Personnel of the division work in close cooperation with other divisions at the headquarters level, and with operations personnel at the district, state, and local levels, so that all control program activities may be integrated to the greatest extent possible.

These services are rendered chiefly in connection with CDC operational projects on malaria and typhus control. However, personnel of the headquarters division, as well as district and state entomologists, are available to offer these services to other divisions of CDC, and to any other agencies which request them. Consultative services are provided to the Engineering Division in surveys of impounded water in regard to malaria control; to the Production Division on films and film strips; and to the Laboratory Division and the Library and Reports Division on entomological preparations, manuscripts, and similar materials. The division also offers consultative service on insect control problems in public institutions, insect pest problems which may be of public health importance, and pest mosquito problems.

Services to operational programs are provided through entomologists assigned to districts and states. Malaria control programs are divided functionally into mosquito larvicidal projects and mosquito adulticidal projects. On larvicidal projects, areas are surveyed to determine breeding places of Anopheles mosquitoes, and results of control work are evaluated by routine inspections of treated areas and by maintaining indices to adult populations. When control work is unsuccessful, careful surveys are made to determine causes. New larvicides used on special projects are evaluated to determine their practical value for operational programs. On adulticidal projects, control areas are surveyed to determine the efficiency of residual spray in keeping houses free from mosquitoes, and particularly in killing mosquitoes which have taken blood meals. The latter involves collecting engorged mosquitoes and making precipitin tests to determine the source of the blood. When it appears desirable to test changes in procedures, careful evaluations are made on special investigational projects.

On the residual dusting program for typhus control, rats are trapped from dusted and undusted premises. Ectoparasites (fleas, lice, and mites) are counted and identified to determine the results of dusting in controlling typhus vectors. The rats are bled, and blood samples are sent to the laboratory for testing to determine the presence of virus as an evaluation of results in terms of decreased infections. Innovations in ectoparasite control techniques are evaluated by the same procedure, but more intensively. Current studies of this type include use of 5% DDT dust rather than the presently recommended 10%, and sprays versus dusts as insecticides.

FIELD INVESTIGATIONS

The planning and conducting of special field investigational projects on insects of known or suspected public health importance involve biological studies of these insects to determine their feeding, flight, breeding, and other habits, and the application of special control measures. Results on disease control are determined by the Epidemiology Division.

Emory University Field Station - Malaria field studies are being conducted at Newton, Georgia, in cooperation with Emory University to measure as many factors related to the occurrence of malaria as possible. Observations are made on malaria morbidity, anophelism, and attendant physical factors which influence them. It is anticipated that these studies will provide data on the trend of malaria control operations. Plans are being made to establish one or more additional projects of this type further west in the malaria belt.

Dysentery Control - This project, operating out of headquarters in Pharr, Texas, in cooperation with the National Institute of Health, is designed to determine the relative importance of the role of flies in the spread of dysentery, and whether flies can be controlled effectively and economically by the insecticides now available. Records to date indicate that a reduction of about 75% in dysentery rates in children under two years of age has resulted in one area apparently as a result of fly control. The current problem is to test the present control method in other areas, as well as to work out more efficient and economical fly control procedures.

Encephalitis Studies - Studies of the mosquito vectors of encephalitis are being conducted, in cooperation with the Hooper Foundation of the University of California, to determine the most effective means for controlling encephalitis transmission to humans. The habits of mosquito vectors, their breeding places, flight range, feeding habits, etc., are being investigated to devise suitable control techniques. Also, the bird reservoirs of encephalitis are being determined, and their habits are being studied in the hope of finding control "leads."

Malaria Field Studies - The malaria field project at Manning, S. C., now under the direction of the Epidemiology Division, will be transferred to the Entomology Division on July 1, 1947. The purpose of this project is to evaluate the effectiveness of DDT residual spray on malaria in the field.

Miscellaneous Projects - At the request of the U. S. Engineers, the Entomology Division is conducting a survey of the public health importance of water-hyacinth growths as related to malaria mosquito production. The division is also cooperating with the Georgia Department of Public Health in field studies on malaria and Rocky Mountain spotted fever. This work is principally on a consultative basis, although a minor amount of financial assistance is also provided. Entomological consultative service is also being provided to the Epidemiology Division on the fly-polio field project at Montgomery, Alabama, and the typhus dusting project at Thomasville, Georgia.

TECHNICAL DEVELOPMENT DIVISION

DEVELOPMENT OF NEW TECHNIQUES, MATERIALS, AND EQUIPMENT TO IMPROVE PRESENT PRACTICES IN COMMUNICABLE DISEASE CONTROL; EVALUATION OF CURRENT DISCOVERIES IN THIS FIELD AND DEVISING OF PROCEDURES FOR THEIR PRACTICAL APPLICATION; CONTINUOUS SURVEY OF EXISTING MATERIALS, EQUIPMENT, AND PROCEDURES TO DETERMINE IF THEY MEET REQUIRED SPECIFICATIONS, AND THE CORRECTION OF DEFICIENCIES.

ADMINISTRATIVE BRANCH

CLERICAL, FISCAL, AND ADMINISTRATIVE PROCEDURES.

SERVICE BRANCH

CARPENTRY, GUARD AND JANITORIAL SERVICES.

INSECTICIDE INVESTIGATIONS BRANCH

DEVELOPMENT AND LABORATORY EVALUATION OF CHEMICAL AGENTS FOR CONTROL OF ARTHROPODS OR HELMINTHS OF PUBLIC HEALTH IMPORTANCE.

CHEMICAL INVESTIGATIONS BRANCH

DEVELOPMENT, AND EVALUATION OF CHEMICAL FACTORS RELATING TO COMMUNICABLE DISEASE CONTROL.

EQUIPMENT DEVELOPMENT BRANCH

DEVELOPMENT AND EVALUATION OF EQUIPMENT USED IN COMMUNICABLE DISEASE CONTROL. DESIGN AND FABRICATION OF APPARATUS FOR INVESTIGATIONAL WORK, AND PERFORMANCE OF MECHANICAL MAINTENANCE.

CONTROL METHODS AND EVALUATION BRANCH

DEVELOPMENT, TESTING, AND EVALUATION OF OPERATIONAL PROCEDURES FOR CONTROL OF VECTORS OF COMMUNICABLE DISEASES.

RODENT AND ECTOPARASITE CONTROL BRANCH

DEVELOPMENT OF MATERIALS, METHODS, AND OPERATIONAL TECHNIQUES FOR CONTROL OF RODENTS AND THEIR ECTOPARASITES.

VECTOR-TRANSMISSION INVESTIGATIONS BRANCH

INVESTIGATIONS OF DISEASE TRANSMISSION BY ARTHROPODS TO NONHUMAN HOSTS, UNDER VARIOUS ENVIRONMENTAL AND ECOLOGICAL CONDITIONS AS APPLIED TO CONTROL OPERATIONS.

TECHNICAL DEVELOPMENT DIVISION

The objective of the Technical Development Division is the expediting of operational programs through technical guidance, based on practical investigational work. Almost every activity of the division is initiated because of a definite need for assistance on a specific operational deficiency or lack. Deviation from this practice occurs only where information of a more basic nature is necessary as a foundation for the practical solution of an operational problem.

Eight branches carry out the function of this division:

The Insecticide Investigations Branch develops and evaluates chemical agents for the control of larval and adult arthropods and helminths of public health importance. An insectary supplies test specimens for laboratory and field investigations.

The Control Methods and Evaluation Branch carries on field evaluations of materials and develops operational techniques for the control of larval and adult mosquitoes, flies, other premise-infesting arthropods of public health importance, and hookworms.

The Chemical Investigations Branch conducts tests on commercial emulsifiers, spreaders, wetting agents, solvents, diluents, and other constituents of chemical compounds used in the control of insects and rodents. The synthesis of potential insecticides, helminthicides, and rodenticides will be undertaken as soon as additional personnel become available. This branch also performs chemical analyses and formulations for other branches of the division.

The Rodent and Ectoparasite Control Branch develops and tests materials, methods, and operational techniques for the control of rodents and their ectoparasites. A major portion of the time has been devoted to developing procedures for the use of DDT in rodent ectoparasite control. An attempt is now being made to develop a premise spray program that will give adequate malaria protection and at the same time satisfactorily control rodent ectoparasites. Rodent control investigations also include the determination of resistance to gnawing of various construction materials.

The Equipment Development Branch designs, fabricates, and evaluates the performance of equipment for the preparation and dispersal of sprays, dusts, and aerosols from both land and air, and improves existing commercial models. This branch also constructs special apparatus for laboratory and field investigations; maintains the insecticidal, laboratory, and automotive machinery; and makes applications of airplane sprays and aerosols for field evaluation studies.

The Vector-Transmission Investigations Branch, initiated recently, investigates disease transmission by arthropods to non-human hosts under various environmental and ecological conditions, as they apply to control operations.

The other two branches carry out the administrative and service duties of the division. The Administrative Branch is responsible for clerical, fiscal, and administrative procedures, including the preparation and reproduction of reports, forms for the collection of field data, work outlines, and similar materials. The Service Branch provides guard, janitorial, and carpentry services, including the fabrication of special research equipment and the repair and maintenance of the buildings.

ADMINISTRATIVE DIVISION

DIRECTION AND COORDINATION OF PERSONNEL, FISCAL, SUPPLY, AND MAINTENANCE FUNCTIONS.

PERSONNEL BRANCH

ESTABLISHMENT AND ADMINISTRATION OF PERSONNEL POLICY; ESTABLISHMENT OF GRADES AND SALARY LEVEL IN ACCORDANCE WITH CIVIL SERVICE REGULATIONS; RECRUITMENT, EXAMINATION, AND PLACEMENT OF PERSONNEL; PROCESSING AND MAINTENANCE OF PERSONNEL RECORDS.

SERVICE BRANCH

DRAFTING, REPRODUCTION, AND MACHINE RECORDS; PREPARATION OF MAPS AND CHARTS; MIMEOGRAPHING, MULTILITHING, AND DISTRIBUTION, MACHINE RECORDS PUNCHING, SORTING, TABULATING AND RECORDING.

FISCAL BRANCH

PREPARATION OF BUDGETS; CERTIFICATION OF EXPENDITURES; PRESCRIPTION OF FISCAL PROCEDURES; INSPECTION OF HEADQUARTERS AND FIELD EXPENDITURES; MAINTENANCE OF ACCOUNTING RECORDS AND ANALYSES; REVIEW AND CERTIFICATION OF VOUCHERS; EXAMINATION AND CERTIFICATION OF PAYROLLS.

SUPPLY BRANCH

PURCHASE AND DISTRIBUTION, OF SUPPLY EQUIPMENT AND SERVICES RECEIVES, STORES, AND SHIPS SUPPLIES; MAINTAINS RECORDS OF SUPPLIES, PROPERTY, AND AUTOMOTIVE VEHICLES; REPAIRS AUTOMOTIVE AND MECHANICAL EQUIPMENT.

ADMINISTRATIVE DIVISION

The Administrative Division is primarily a CDC service unit; its existence, its size, and its functions are dictated by the need of the professional activities - whether operational, investigational, or otherwise - which it serves.

The major responsibilities of this division embrace appointment, classification, and separation of all headquarters and field personnel; the carrying out of property regulations and the security of all public property assigned to the center; the control and expenditure of funds; the procurement of supplies and equipment; the issuance of travel authority; and the processing of vouchers and payrolls. Other responsibilities include telephone, telegraph, mail, and messenger service, maintenance of all files and records, and the preparation of reports and claims for property damage arising out of CDC operations.

Four branches carry on the functions of this division. Two - the Service and the Supply Branch - are primarily service units. The other two - the Fiscal and the Personnel Branch - may be considered as management units. In addition there are 22 state or project administrative offices, which function in a similar manner and are technically responsible to the headquarters division.

The Fiscal Branch is responsible for the preparation of consolidated budgets, control of allotted funds, certification of all expenditures, and accounting records of expenditures. It has been delegated authority for final audit and payment of personnel services, for control of disbursement of funds through the local disbursing office, for approval of expenditures, and for the approval and issuance of travel authorizations.

The Supply Branch procures supplies and equipment, keeps property records, maintains and repairs vehicles, and handles storage and distribution of supplies, equipment, and materials. Final authority has been granted this branch to issue purchase orders for supplies and equipment without regard to amount, to negotiate and prepare continuing or other contracts for definite quantities not to exceed $2000, and to reclassify property within certain limits.

The Personnel Branch establishes and administers personnel policies and procedures, integrates the personnel program with the operational program, and insures the observance of Civil Service rules, regulations, and policies governing personnel administration. Delegated authority has been given to this branch to allocate positions and to recruit, appoint, promote, transfer, and demote personnel through the grades P-3, CAF-9, SP-8, and CPC-10.

The Service Branch offers complete reproduction and distribution service, and has facilities for the tabulation of engineering and statistical data by use of IBM equipment. Reproduction services include cutting stencils and mimeographing; vari-typing and multilithing; preparation and reproducing of drawings, maps, charts, graphs, and forms; the ditto and "ozalid" printing processes; embossing for signs; and assembling, stapling, and distribution of reproduced materials.

THE AEDES AEGYPTI PROGRAM

Reprinted from March, 1943 Monthly Report, U.S.P.H.S. Malaria Control in War Areas, Atlanta, Ga. (with minor revisions on July 1, 1943).

Aedes aegypti, the mosquito which is primarily responsible for the transmission of yellow fever and dengue, has followed man completely around the world in the tropics and sub-tropics on every continent. Its closest relatives in the subgenus *Stegomyia* are tree-hole breeders in Africa. Somewhere in its past history it developed two habits that have become as fixed in its genetic constitution as the silvery, lyre-like markings of its thorax and the snowy white bands of its legs. These are (1) a close association with man (breeding never occurs at any great distance from man's habitations) and (2) the predilection for artificial water containers for breeding purposes, at least for those members of the species that have migrated away from Africa.

Its ancestral habit of breeding in tree-holes is emphasized by its preference for wooden containers, then earthenware or cement ones and finally, metal. Apparently this habit is controlled by its oviposition procedure as its eggs are laid on the surface of the water at the waterline or just above the waterline on the sides of the container. Thus the sides of the container exercise more influence than the bottoms which may be as clean as the sides or covered with sedimented mud or debris. However the contained water does influence the choice, as clear, although not necessarily clean, water is preferred.

The fact that yellow fever is ordinarily confined to the tropics and sub-tropics is that its principle carrier, *Aedes aegypti*, flourishes only in the presence of relatively high temperatures. The eggs and larval forms (wrigglers) can survive considerable cold weather, even short exposures to freezing temperatures. However, continued cold weather, (50^0 - 68^0F. nightly for 70 days) destroys 95 per cent of exposed eggs. Although we have no experimental evidence available, observation suggests that prolonged cold, even when well above freezing, produces considerable mortality among larvae. Adults feed, breed and oviposit with great facility at temperatures between 80^0 and 87^0F. As the temperatures decrease oviposition is the first function to fail, feeding ceases at slightly above 60^0 F., activity ceases at 50^0 F. and death is produced by twenty-four hours exposure to temperatures of 42^0 F., and almost immediately below 32^0 F. Hence the rejoicing with which the first frosts were greeted in epidemic years in our stricken cities when the virus of yellow fever was a frequent visitor to our shores, or in recent years when the dengue virus was rampant in some of our southern communities.

This resume of temperature requirements immediately raises the question of *aegypti* survival in the United States. The only frost free city in the country is Key West. Hence it should be the only city of continuous breeding with adult females available at all times of the year. This is probably true over a period of years although other cities may have occasional years when no frosts occur. However, yellow fever has been epidemic as far north as Ohio and New England and even Quebec, and the usual explanation has been that the mosquito vector was reintroduced each year during the hot summer months when conditions were favorable for its propagation. This is probably true for the more northerly areas of its recorded distribution. However in the border line area represented by the deep South where some stages of the mosquito can be demonstrated in nearly every month of the year, other explanations will doubtless be forthcoming. The mosquito-lore of *aegypti* has been written in the tropics and is voluminous, but much less is known of its vagaries in the southern United States or in its extensions into the arid West (as far as Tucson, Arizona) or to the northern limits of its known distribution (Southeastern Canada).

Carter reported an observation of Mr. Le Prince at Carbondale, Illinois where he observed reproduction and feeding of *aegypti* on January 19th and March 20th in a hotel where breeding was flourishing in a container for flower pots. If this were general, it would be easy to account for the relatively rapid build-up of the species when warm weather returns; but in our, as yet rather limited, experience in connection with the present *aegypti* program, we have been struck by the paucity of inside breeding during the winter months. At Savannah, Georgia where no organized control work was performed last summer, the initial inspections made in late March and early April showed a very small percentage of breeding, less than two per cent of the premises visited, with about two inside breeders to one outside. However most of the so-called "inside breeders" were fire barrels, troughs and relatively large containers in semi-public buildings and not the domestic type of water plant, flower-vase breeder that we ordinarily picture as the typical inside breeder.

More information may change the picture radically but from the information at hand it would seem that *aegypti* winters-over in the southern portion of the frost belt as a slowly maturing larva in relatively large containers of water in protected places. In addition, a number of eggs deposited in the fall before the females were killed by cold weather probably still remain viable and await the advent of water in the containers where they were deposited and warm weather to speed their development. In the more northerly portions of its normal range (north of Norfolk, Virginia) it must depend on inside breeding in unusually well heated buildings or passive reintroduction from the south as eggs on containers, as larvae on riverboats or coastwise ships or as adults in trains, automobiles, or airplanes. Other factors than temperature undoubtedly restrict its distribution in the Southwest and up the Pacific Coast. Apparently low humidity and the absence of summer rains is a controlling influence..

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DENGUE FEVER

The origin of the name is as confused as the multiplicity of pronunciations which range from deng'-gu to deng'-gay to what is perhaps the most common in this country, - deng'-gy. One of the most plausible explanations is that it comes from the Spanish word danguero which means fop or dandy and was applied because of the stiff backed gait common to both sufferers from the disease and the Beau Brummells of the period. In fact, one of the commonest names for the disease is "dandy fever" which lends credence to the story of its derivation. Others are "break-bone fever" applied by Rush, three-day, six-day or seven-day fevers, the last three of which are by no means confined to dengue alone.

In the light of the present day distribution of dengue it is interesting to note that one of the first good descriptions of the disease was written by Benjamin Rush shortly after the Revolution during an epidemic in Philadelphia, which serves to remind us that dengue like yellow fever, has penetrated as far within this country as New York and Boston on several occasions.

In fact, dengue completely encircles the world following the distribution of *Aedes aegypti* and *Aedes albopictus*. Unlike yellow fever however, it has penetrated to South Asia, Australia and the Pacific Islands and occurs in endemic form at various spots around the Mediterranean and sporadically throughout the entire basin. In the United States it occurs sporadically along the South Atlantic Coast, the Gulf Coast and up the Rio Grande Valley. Its appearance is sudden, apparently without any long time build up from previous seasons and generally devastating in its results. Serious epidemics involving from 25 to 75 per cent of the populations have occured in West Texas in 1885, in Galveston in 1897 followed by another in 1922 which centered at Houston, and in South Florida in 1934.

The disease is caused by a virus which circulates in the peripheral blood of the patient from one day before the onset of the disease until the third or fourth day of illness.

The onset is sudden and characterized by a rapid rise in temperature, headache, backache, pain behind the eyes, and sometimes in the limbs. After the first spectacular rise in temperature there is apt to be a cessation followed by another rise after which there is a gradual fall in temperature over a series of days. The average febrile period is about five days but it may be as short as one or as long as ten or eleven days. With the appearance of the second rise in temperature a rash generally appears which when present may vary from a fleeting flushing of the skin to a heavy rash resembling German measles and by desquamation.

The most important single diagnostic aid is the pronounced leukopenia (decrease in white blood cells) beginning on the second day. This decrease is caused by the loss of both mononuclears and polymorphnuclears, the latter sometimes showing decreases of as high as 90 per cent of normal. Less constant symptoms are the swelling or tenderness of cervical or inguinal lymph glands and painful, swollen joints.

Convalescence is often long and discouraging with attacks of neuralgic pains, mental depression and prolonged weakness. During the attack it is impossible to convince patients by means of statistical evidence on the almost non-existant mortality rate for the disease, that they, at least, are not going to be the exceptions that prove the rule.

When once recognized in epidemic form few cases will escape recognition, but single cases or even a small epidemic may be missed in the early stages. Diagnoses of malaria, measles, influenza, rheumatic fever and even yellow fever have been mistakenly made with considerable justification in the light of the varied phases that the disease may manifest. One old practitioner who had seen lots of dengue in various parts of the world once said facetiously that before a diagnosis of dengue was generally made it was necessary to present the diagnostician with at least 25 cases occurring in the same locality within twenty-four hours.

The Rift Valley fever of Kenya Colony and papataci or phlebotomus fever of the Mediterranean, East Africa, India and China resemble dengue in many respects including the leukopenia but are transmitted by different vectors, and the viruses are immunologically different. Panamanian six-day fever, the seven-day fever of India (not the 7-day leptospirosis) as well as Van der Scheer's five-day fever of Malaya and Bwamba fever of Uganda may be variants of dengue. The absence of susceptible experimental animals makes it difficult to be definite on these points.

The problem of immunity following an attack of dengue is confused by conflicting reports, many of which undoubtedly originate in cases mistakenly diagnosed as dengue or possibly by a multiplicity of virus strains. Apparently there is a certain amount of immunity which, if constantly rejuvenated by annual attacks which are practically unnoticed, may maintain what appears to be a life-long immunity. On the other hand there is considerable evidence that the immunity from a single attack does not protect a person for much over two years. No successful vaccine has been developed.

The early experimental work on transmission by mosquito vectors has caused considerable confusion in the literature and an undue amount of futile control work. In 1903 Graham announced that he had successfully transmitted dengue by the bites of *Cules quinquefasciatus*. Later his results were apparently confirmed by Ashburn and Craig (1907) but later developments indicate that Graham had a mixed collection of mosquitoes which apparently contained *aegypti* and out of Ashburn and Craig's nine volunteers only one was thought to be susceptible and it is not definite that his case (the only positive) was not contracted before the beginning of the experiment. Furthermore the possibility of mechanical transmissions by soiled mouthparts should not be entirely overlooked.

During the middle twenties it became evident that *Aedes aegypti* and *Aedes albopictus* were biological carriers. It was shown that these mosquitoes ingest the virus from patients during the period that it is circulating in the blood and after a period of from eight to eleven days, depending on the temperature, their bites become infective for the remainder of the mosquito's life.

In the late twenties and early thirties Simmons and his associates in Manila did an enormous amount of sound work in clearing up many of the puzzling phases of dengue research. Among other things they demonstrated that *Macacus* monkeys *(Philippinensis)* were susceptible to symptomless attacks by passing the virus from man to monkeys, through other monkeys and back to man. Inasmuch as adult monkeys from endemic areas were immune while those imported from outside were susceptible they assumed that young monkeys might serve as a source of continuing the virus in the absence of human cases.

In addition they reported accurate details of the course of infection in over eighty experimental cases produced with the same strain of the virus which did much to stabilize our understanding of the disease.

Like yellow fever, dengue is forced to maintain itself in areas where continual breeding of its mosquito carriers is possible throughout the year as the virus is not transmissable through the egg to the next generation of mosquitoes. This latter possibility is the accepted procedure in the case of viruses transmitted by ticks or mites. Until, however, some arthropods in this class are found that are capable of transmitting dengue we must program our thinking along the line of mosquito transmission.

Consequently, dengue epidemics will appear in this country only when infected mosquitoes or human cases of the disease are introduced during the season when adult *aegypti* mosquitoes are prevalent in sufficient numbers to guarantee the perpetuation of the infection.

YELLOW FEVER

Yellow fever, the dreaded "Yellow Jack" of the tropics, visited continental United States last in 1905, five years after the famous experiments of the U. S. Army Yellow Fever Commission at Havana had demonstrated that *Aedes aegypti*, then called *Stegomyia fasciata*, was the vector responsible for spreading the disease from man to man. At New Orleans, the epidemic gave promise from the virulence of the virus of being one of unusual severity. However, for the first time in the history of this country, an epidemic of yellow fever was brought under control before the advent of frost. The measures adopted were screening and larviciding.

The accomplishments of the Army Commission have won for it the well deserved credit of having demonstrated conclusively the mode of transmission of yellow fever and thus paved the way for its control. However, it should be pointed out that the members were "conditioned" for their epoch-making demonstration by a series of events that have been generally overshadowed by the glamour of their accomplishment, the boldness of their procedures and the martyrdom of Dr. Lazear.

Since 1881, Carlos Finlay, a prominent Scotch-French physician of Havana, had been advocating his insistence that *Culex Mosquito R-D (Aedes aegypti L.)* was the vector of yellow fever and had carried on 104 infectivity experiments in which he claimed (by feeding the infected mosquitoes on nonimmunes at intervals of only 2-5 days after ingesting infectious blood) to have produced mild cases of yellow fever which conferred immunity.

In 1883 he published in parallel columns the critical points for yellow fever epidemics such as the temperatures at which they decline but may resume, the temperature which permanently arrests an epidemic, the degree of heat that accomplishes the same result and the altitude at which epidemics do not occur. In the opposing column he showed the effects of these same conditions on *aegypti*, thus producing a circumstantial case against this mosquito that only needed the application of one other bit of information to lay all the ground work for the successful experiments of Reed and his associates on the Army Commission.

This missing link which had frustrated Finlay in the production of frank yellow fever was supplied by Dr. Henry R. Carter of the Public Health Service. In 1898 he had determined what he denominated as the "extrinsic" incubation period of yellow fever as 12 days. This was the smoldering period between the first cases of yellow fever in an epidemic and the appearance of secondary cases. We know now that it is the usual time required for *aegypti* mosquitoes to become infective after having obtained a meal of infected blood.

Relatively recently Davis has shown that this "extrinsic" incubation period which normally takes 12 days may be reduced to 4 days at 98° F. or extended to 18 days at 70° F. Furthermore, between 50° and 60° F. the progress of infectivity ceases in the mosquito but resumes again at higher temperatures.

Based on the results of the Commission's findings the emphasis for the next quarter of a century was almost solely on control. Gradually yellow fever was being stamped out of South America and equatorial Africa was being considered as possibly the last stronghold of the disease. Then in 1928 Stokes, Bayer, and Hudson found that *Macacus* monkeys could be infected. This spurred on the work of infectivity experiments with scores of other mosquitoes and blood sucking arthropods. This was followed shortly by Sawyer's work in which he perfected a method of infecting white mice and thus made possible the serum-protection test by which the immunity of persons to yellow fever could be tested accurately. This facilitated the testing of populations to determine their previous experience with yellow fever.

The value of these new developments has been amply demonstrated, for without them the newer chapter in yellow fever history could never have been accomplished.

In 1929 at Socorro in the mountains of northeastern Columbia there occured an epidemic which apparently had no connection with introduced cases and raised suspicions of the possibility of so-called "latent" yellow fever. The next year the small Columbian town of Muzo experienced a similar violent epidemic. Mouse protection tests revealed that yellow fever was actually endemic but the investigators in the area, like several of their predecessors, were forced to come to the conclusion of "yellow fever without *aegypti* mosquitoes" which had been biological heresay of the rankest sort for thirty years. A blue tree-hole mosquito *Haemogogus capricornii* was suspected and later experiments justified the suspicions.

Similar sporadics of jungle yellow fever were noted in Brazil and the prevalence of *Aedes scopularis* and *Aedes fluviatilis* which Davis and Shannon had shown capable of transmission in 1929 and 1931 were assumed to be the responsible vectors although the former, a semi-domesticated species is not a strong carrier.

In the meantime, of course, the question of warm-blooded hosts of the virus other than man came to the fore. That *Macaus* monkeys could be infected had been known since 1928 and with this information available and the mouse protection procedure, it was possible to carry on extensive tests with wild animals which did not demonstrate symptoms but which did circulate the virus in their blood, where it might be picked up by susceptible vectors. In addition, the development of immunity was demonstrated in these wild animals by mouse protection tests, thus approaching a means by which surveys to determine the extent of jungle yellow fever might be carried on.

In rapid succession, wild primates, marsupials and rodents were shown to be susceptible carriers in whose blood the virus would circulate for the initial days of the attack and thus serve as a continuing source of infection to the susceptible mosquitoes.

Immediately the picture of yellow fever control took on a sinster and disappointing aspect. With a backlog of infection in the form of jungle yellow fever existing throughout the northern South America far beyond the areas inhabited, even sparsely, by whites, the determination and hope of the 20's to eliminate the disease from this hemisphere faded abruptly. *Aegypti* mosquitoes still remain the great threat for urban populations and unless vigilance is maintained constantly to keep them eliminated from the principal cities of South America and reduced to negligible percentages wherever appreciable numbers of non-immunes are congregated, the chance introduction of a case of jungle fever may produce serious consequences.

Fortunately during all this time, work had been steadily progressing in the strides leading toward a process of human immunization. First, the knowledge that small amounts of convalescent serum would protect against inoculation with the virus; then the production of a fixed neurotropic strain of the virus and finally a combination by Sawyer and Lloyd in 1931 of this fixed strain of the virus with sufficient convalescent serum to protect yet sufficiently potent to cause anti-body formation and protection.

From this point a series of differently cultured strains of the virus were introduced, particularly one that was grown on chick embryos and then mixed with non-immune human serum. The possibility of the departure of large numbers of our troops and sailors to yellow fever territory resulted in the vaccination of literally millions of men with chick-embryo-human serum vaccine. A considerable number of cases of post-vaccinal jaundice led to the substitution of a similar vaccine in which distilled water was substituted for the human serum. The Public Health Service has now liberated over 600,000 doses of the new aqueous base vaccine, each preparation of which is carefully controlled by animal experimentation without encountering any unfavorable reactions.

The production of a safe and relatively inexpensive vaccine comes at a particularly fitting time when we must apparently make up our minds to live with yellow fever, particularly the jungle phase.

We are also particularly grateful for this tool when we consider the added possibility of yellow fever expansion that is possible with the extensive travel by air to the teeming millions of India or the war-impoverished cities of the Mediterranean. There the stage is continually set by the presence of *aegypti*, a welcoming climate, and millions of non-immunes. It only awaits the entry of the principal villain, the virus itself, either in the body of an infected mosquito or in an unrecognized case.

In the continental United States, our chief source of danger is in returning personnel from South American installations that are being constructed for military purposes in hitherto inaccessible points where jungle yellow fever is present.

Our chief strength lies in our awareness of the problem and our preparedness for its possibility. This note is written solely for the purpose of educating and not alarming; for it is as self evident in connection with this problem, as elsewhere in public health, that "what we don't know will not hurt us" is the rankest fallacy.

CONTROL

There are two main schools of thought in *aegypti* control with many variations of each, all of which are predicated on tropical conditions. Both agree that the only solution to the *aegypti* problem is eradication, the practicability of which has been demonstrated in the principal cities of Brazil. One school believes however that the only method of accomplishing elimination is by a concerted, simultaneous attack on every possible type of breeding place in the community from roof gutters to cellar sumps. The other group would first concentrate on the "mother foci" searching out every permanent container such as cisterns, shallow wells, fire barrels, sumps, and similar situations which hold water year in and year out. They would ignore such breeders as roof gutters which will eventually be flushed out by storms, tin cans which will rust out, flower vases which will be emptied and other temporary breeding places, until the concentrated attack on mother foci has been accomplished. They believe that as the mother foci are eliminated, "seed" for the non-permanent places will be cut off and the incidental breeding in the tin cans and flower vases will decrease in direct proportion to the elimination of the mother foci. In fact the continued breeding in an area in vases, cans and similar containers is considered to be an indication that a mother focus in that immediate area is still existant. Our observations to date are wholly in accord with the latter procedure as a routine, efficient manner of approach. Under epidemic conditions where the quickest possible elimination or reduction of adult females is the ultimate goal and expense and man power are of secondary importance, naturally the all-out, shotgun procedure is the only one to adopt.

When it is considered that the adult female *aegypti* seldom flies on her own power more than 75-100 yards from the container in which she lived as a larva, it becomes apparent at once that practically everyone breeds his own household supply. Control is an individual problem or at least a community problem that can be solved by individual effort without the need for group action, or finance, or expensive equipment.

For this reason it is a problem in community service in which education can be translated into action by any able bodied man, woman or child without the necessity of awaiting group action, legislation, financial support or anything other than the desire and the expenditure of a few minutes of time to do his part in making the community a safer and healthier place in which to live.

In the Texas, South Carolina, Georgia and Louisiana projects, we have consequently placed a great deal of emphasis on the educational phases of the program, believing that it was the democratic approach which would educate the public to its responsibilities but tinged, perhaps, by the knowledge that we lacked the man power and funds to inaugurate a paternalistic campaign in which trained employees would do the necessary work much faster and more efficiently and thoroughly.

The results of this educational work, supplemented by expert inspection and the incidental correction that accompanies the inspections has been surprisingly gratifying. In Houston, for instance, in a city of 450,000 people our paid inspectional staff consists of only six inspectors. If we operated there as we did in Key West with the inspection of each premise both outside and inside on a schedule approaching a complete inspection of the city each week and with all the incidental special services of an epidemic campaign, it would require 800 employees. By interesting the school children, luncheon clubs, firemen and other organizations and by continual news releases, radio and movie contacts, the index of premises breeding *aegypti* was held at a figure generally below the 5 per cent that has been empirically established as the percentage below which epidemic yellow fever or dengue is not possible. All of our projects in Texas - at Galveston, Corpus Christi, Brownsville, San Antonio and Hidalgo County - are being conducted on this basis with major emphasis on education and public cooperation through individual effort augmented by the efforts of an otherwise entirely inadequate staff of inspectors.

In Florida, the Key West project has been carried on with all the services that would be inaugurated in the time of an epidemic. Inspectors visit each room of every dwelling and business establishment in the city approximately once a week; every potential mother focus in the city is numbered and visited once a week for appropriate treatment; all roof gutters are inspected and cleaned at least once a month; all boats in the harbor are inspected at weekly intervals; vacant lots overgrown with vegetation are cleaned in the search for breeding containers or hidden wells or cisterns; tin cans are methodically collected; and the discovery of inside breeding is followed immediately by an aerosol spraying of the premises. When the project was started in June, 1942 the index of breeding was 38 per cent of the properties inspected. By late summer when breeding should have been high, the index had fallen to less than three per cent. It continued to decrease, reaching a minimum of about one per cent during the winter months, and now again during the summer of 1943, has been held at the three per cent level. On September 15, due to the extension of *aegypti* control work in other zones, it is planned to decrease the Key West project to relatively small size.

Miami, Miami Beach, and some of the surrounding county territory are critical areas from the quarantine standpoint on account of the key air fields in the vicinity. Before the War the Public Health Service had been supplementing the appropriations of the Dade County Anti-mosquito District through Title VI funds which had been allocated through the State Health Department to aid in the control of *aegypti* mosquitoes. With the inauguration of *aegypti* control by the MCWA program, the financial and administrative responsibility for the Miami district was assumed by the MCWA office working through the Florida State Board of Health as in the case of Key West. The staff was augmented and the director of the Dade County district was asked to direct the local work.

The inspection and correction program was limited to outside premises except in the case of establishments open to the public. On this basis the breeding index for the calendar year of 1942 was 4.4 per cent for the entire area. From our experience in other cities it is probably that this figure could have been nearly doubled if interior inspections in the residential areax had been included. This index is too high for safety, but the encouraging note is that the index for five special areas including four important air fields and their surrounding communities and the exceedingly extensive military establishments which were inspected both inside and out showed a value of only 1.07 per cent. Similar results have been secured for the calendar year 1943.

Charleston, too, had been receiving Title VI funds through the South Carolina State Board of Health to aid in the control of *aegypti* mosquitoes. In August of 1942 this project was included in our program and an entomologist assigned from this office to direct the local inspection staff. For the period August 1 to November 30 the index for outside inspections only was 2.5 per cent. From December first up until June, 1943 the index has been consistently below 1 per cent, reflecting the fact that Charleston is near the northern limit of the natural range of the species. A little work at Charleston pays surprisingly large dividends. Since June the index has climbed and remained at about two per cent (Sept. 1).

In March, 1943 we inaugurated a survey and incidental correction program at Savannah with headquarters at the Henry Rose Carter Memorial Laboratory. Conditions here are more difficult of control than at Charleston because of the lack of previous work and the increased biological problem incident to its location. Winter breeding is apparently present in Savannah with approximately twice as much interior breeding an exterior. Beginning in May the Savannah index increased very rapidly, creating a serious hazard of a dengue epidemic. The rise continued until July 31, reaching a maximum of 34.7 per cent. Serious labor shortages in the Savannah area have greatly hindered control activities but before the peak of uncontrolled breeding would have occurred, the index began to fall appreciably.

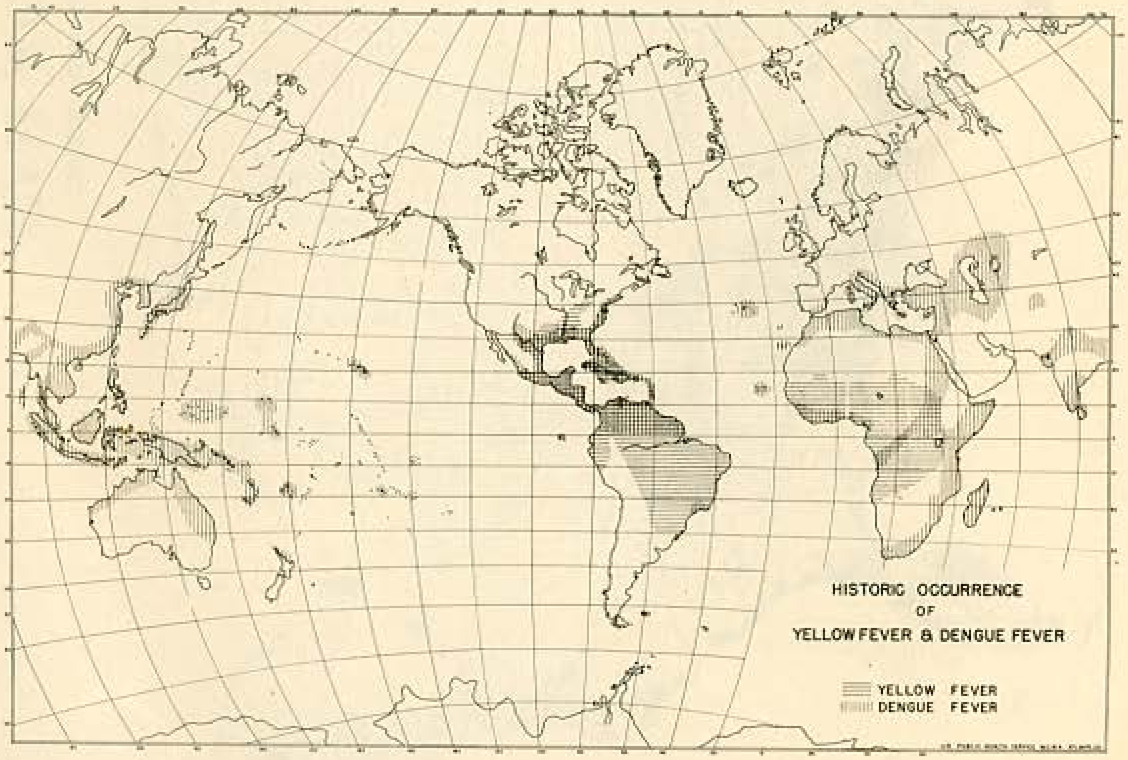
At both Charleston and Savannah, an organized educational effort is being developed in the school system utilizing the program of the Victory Corps curricula. The *aegypti* campaign lends itself particularly well to this program as there is an almost perfect opportunity for education to be translated into constructive action. The effort is being watched with interest as an experiment in the utilization and training of students in intelligent participation in community health programs.

In April 1943, an educational-inspection control unit was inaugurated in New Orleans, historic gateway of yellow fever into the United States, with a force of about twenty inspectors. The New Orleans index has risen steadily from a value of less than one per cent in April to more than five per cent in August. Inspections are made both inside and outside, with about 15 per cent of the breeding occuring inside in water plants. Considerable control work has been conducted in military areas and in the numerous cemeteries.

As this goes to press, work is being inaugurated in Honolulu under the direction of an engineer and entomologist from the MCWA's *aegypti* Section in an attempt to control the epidemic (178 cases, Sept. 4th, 1943) of dengue. The carrier here is probably mainly *Aedes albopictus* although the *aegypti* is also reported to be present. Through the operation of this program we will have demonstrated in a number of representative municipalities the possibility of achieving effective control and possibly even of eliminating this species. In every case, except Key West, we have done the work on a financial scale that is well within the possibilities for continuation by the municipality.

It can easily be seen from the above that the MCWA program, which is designed to protect only War projects, cannot assume the responsibility for protecting continental United States from the appearance of yellow fever or dengue by eliminating *aegypti* mosquitoes or reducing them at all possible points where the viruses may be introduced to a point below the "threshold of sanitary importance". In fact, the mathematical chances are that when, and if, either of these diseases does become epidemic it will be at some point where we have not worked. But we have a trained personnel with full working equipment capable of being marshalled at any point in the Southern States within twenty-four hours after either of these diseases is located. Working out in expanding circles from centers of infection there is no reason why there should be an *aegypti* mosquito left within seven blocks of the focus at the end of the first day's work.

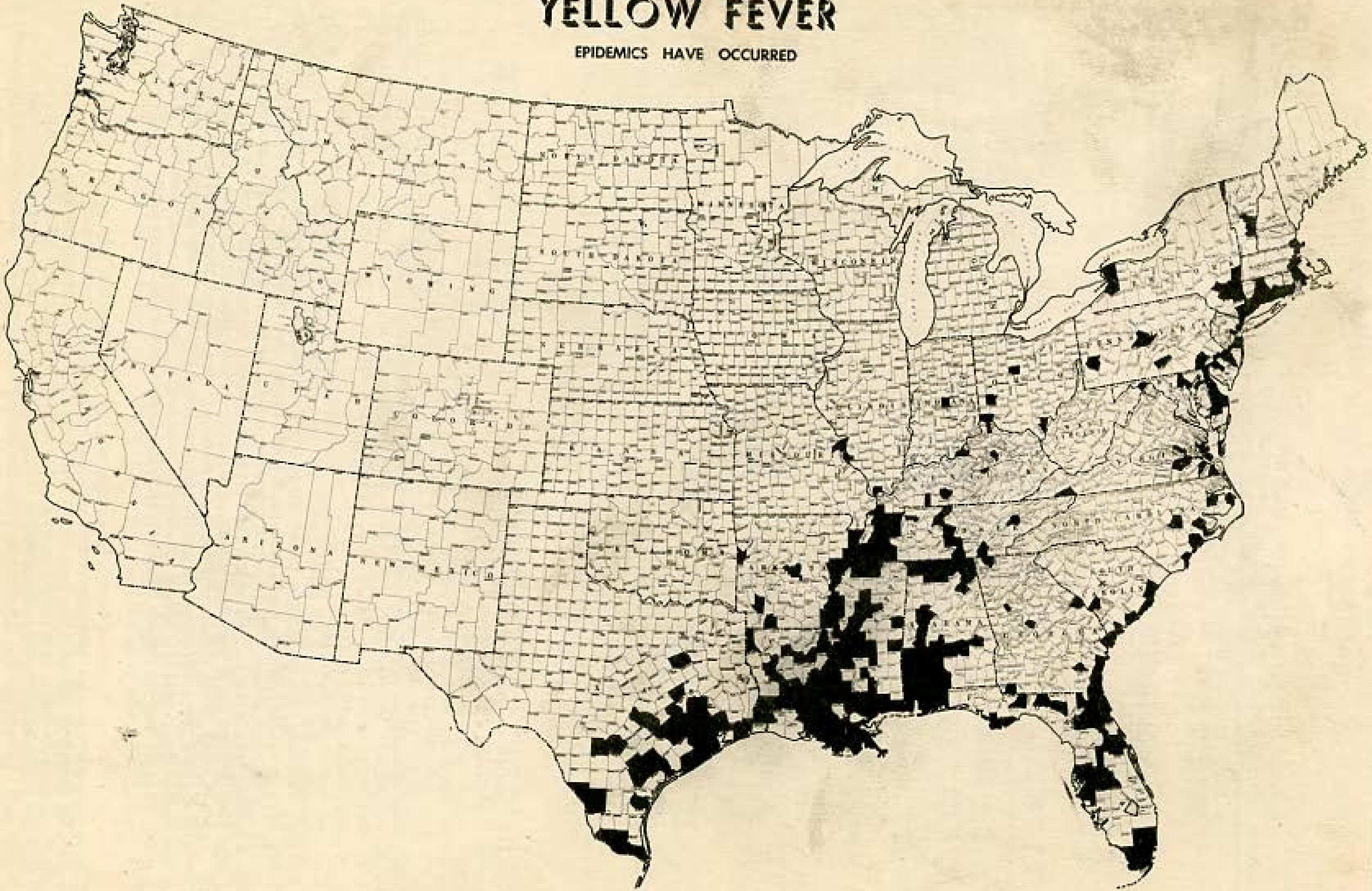
The possibilities of this unit, along with medical precautions such as vaccination, early diagnosis and adequate care of the sick, and an educational campaign to advise the lay public of the neccessary precautions, lead us to believe that any outbreak of yellow fever or dengue would be brought under control quickly and efficiently.



COUNTIES WHERE

YELLOW FEVER

EPIDEMICS HAVE OCCURRED



ATLANTA, GEORGIA

MARCH 1943