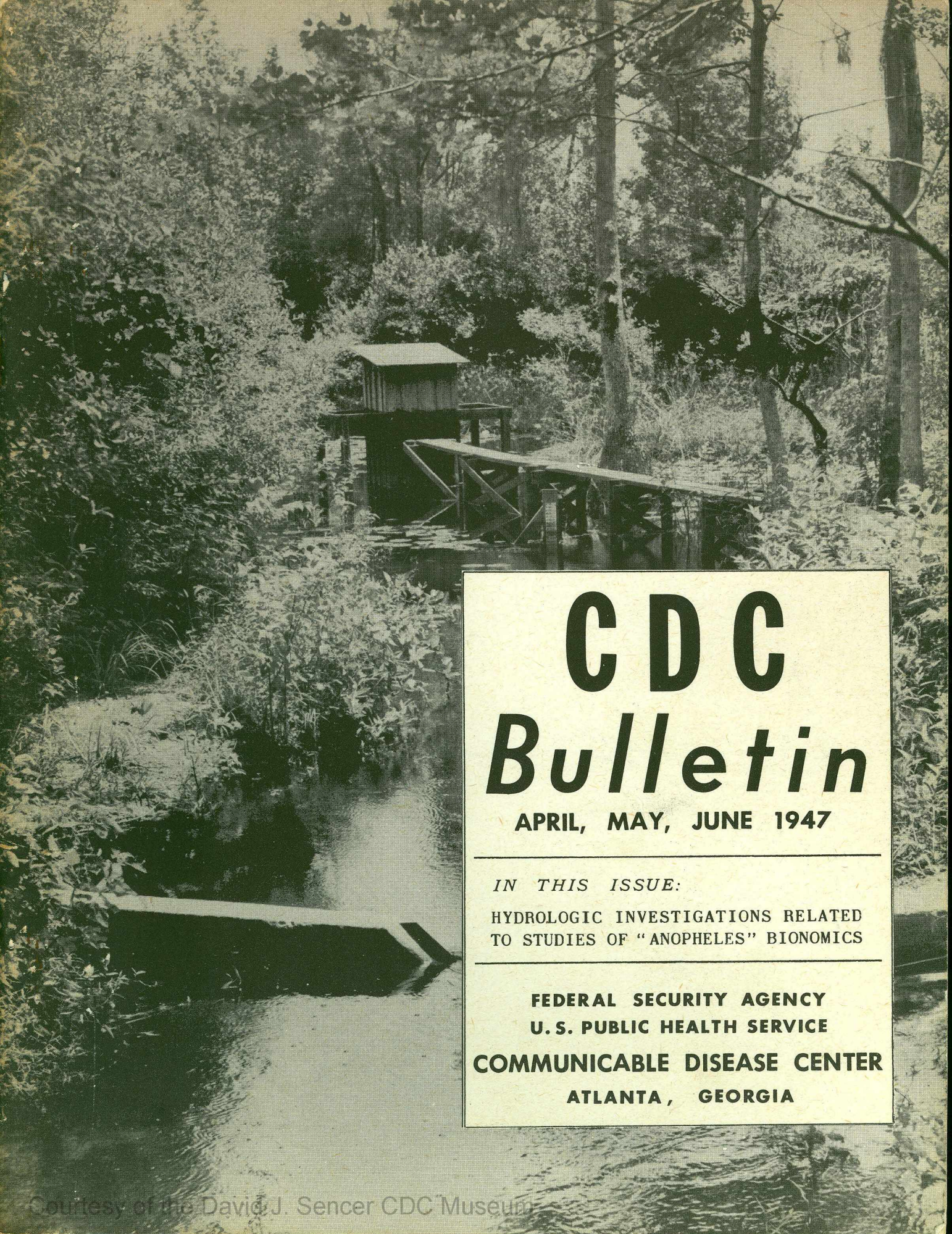

CDC Bulletin

APRIL, MAY, JUNE 1947

IN THIS ISSUE:

HYDROLOGIC INVESTIGATIONS RELATED TO STUDIES OF "ANOPHELES" BIONOMICS

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

CDC BULLETIN

APRIL - MAY - JUNE 1947

COMMUNICABLE DISEASE CENTER
U. S. PUBLIC HEALTH SERVICE
FEDERAL SECURITY AGENCY
Atlanta, Georgia

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Material in this bulletin is not for publication.

HYDROLOGIC INVESTIGATIONS
Related to Studies of "Anopheles" Bionomics

by
E. L. Hendricks, Associate Engineer
Water Resources Branch, U. S. Geological Survey

Ponds constitute the chief type of natural breeding place of *Anopheles quadrimaculatus* in the Southeastern States.

INTRODUCTION

The Water Resources Branch of the U. S. Geological Survey, in cooperation with the Communicable Disease Center and Emory Field Station, is conducting hydrological investigations in southwest Georgia in connection with malaria observations.

Two primary objectives have been outlined for this work: (1) to study physical factors responsible for the existence of ponds conducive to production of *Anopheles quadrimaculatus* and (2) to explore the possibility of predicting *Anopheles* breeding and the occurrence of malaria by observation of certain natural phenomena.

Ponds constitute the chief type of natural breeding place of *Anopheles quadrimaculatus* in the southeastern states, a region underlain with soluble limestone. Hydrological studies are designed to determine factors

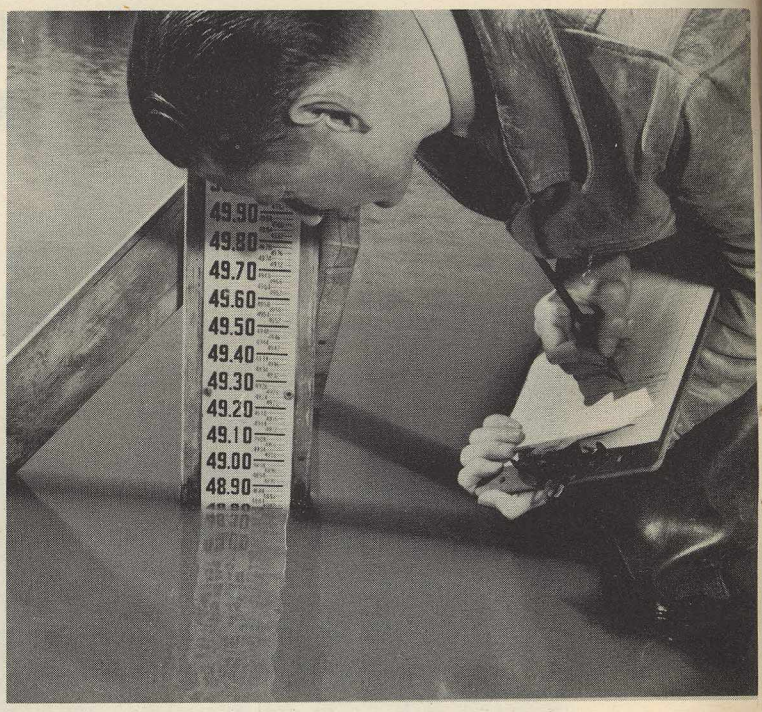
related to persistance of these surface reservoirs during seasons of malaria transmission.

The area in which investigations are conducted is in Baker and Early counties, Georgia. This section is representative of the limestone terrain in the southeast. The experimental area, comprising 130 square miles, is located west of the Flint River, 50 miles above its confluence with the Chattahoochee.

EARLY HYDROLOGIC WORK.

The first hydrologic work was exploratory. Observations included measurements of stage of seven ponds, ground-water levels in 13 observation wells, precipitation at five stream-flow stations. Pond stages were determined once aaweek by reading staff gages. Ground-water levels of the shallow water table were measured in observation wells by usual methods. The stream-gaging stations were equipped with non-recording gages. Standard non-recording rain gages were used to measure precipitation.

Procedures and developments were governed by exigencies of biological investi-



First records of pond stages were obtained by periodically observing ordinary staff gages. Below, staff gage in pond (lower left).

Rainfall records in connection with the hydrologic investigations are obtained with (left) can-type rain gages, or (right) automatic recording rain gages.

gations. Initial observations pertaining to hydrology were undertaken because of their biologic implications. Factors, such as atmospheric temperature and humidity, precipitation, and the temperature of water in which mosquitoes breed, are important considerations in entomological studies.

DEVELOPMENT OF THE PROGRAM

Attempts were made to develop the existing program gradually and systematically. Flexible procedures were designed to facilitate necessary modifications.

As of January 1, 1945, records were being obtained from 15 ponds, 89 observation wells, 6 gaging stations, and 9 rain gages. Recording devices were installed where possible.

Analysis of the first information accumulated indicated that specific relations could not be determined from data obtained in extensive areas. Measurements of factors observed at a distance from the focal point of analysis were of very limited usefulness in appraising conditions related to a specific pond. Consequently, an attempt was made to intensify observations in localized areas. The areas selected were limited usually to the environs of a single pond. Variations of the ponds under observation did not conform to a recognizable pattern. Analysis of data indicated that most of the lime-sink ponds were not exposed areas of the water table. These ponds were usually several feet above the water table, separated by a containing basin of more or less impervious material. Obviously, each pond could be influenced by a wide variety and intensity of conditions. Detailed and precise measurements at specific ponds were essential if pertinent data were to be obtained.

Ground water measurements are made at specially dug wells.

STATUS OF PROGRAM AND DISCUSSION OF RESULTS

At present, intensive investigations are being made of all factors believed to affect the water balance at three ponds. At each location a water-level recorder, automatic rain gage, anemometer, hygrothermograph to measure air temperature and relative humidity, and thermographs with floated bulbs to measure surface water temperature, have been installed. An observation well near each pond is used to measure ground water level.

At one pond, where daily attention is practical, recording instruments are operated on expanded chart scales. This permits accurate subdivision of records so that causal relationships during short intervals of time can be studied. An accurate contour map of this pond and its surface slope areas has been prepared. A stage volume curve has been constructed. From this it is possible to compute accretions to pond storage for periods of rainfall. With this information, analysis of storm rainfall and water level hydrographs can be made. From these data, runoff and infiltration characteristics of the basin are determinable. The validity of the resulting data must be investigated further. If the method does give reliable information and is practical under operational conditions, significant progress will have been made on the problem of anticipating pond levels by observation of related factors. So far, nature has not cooperated in providing the necessary number of cases and range of conditions to permit accurate statistical analyses.

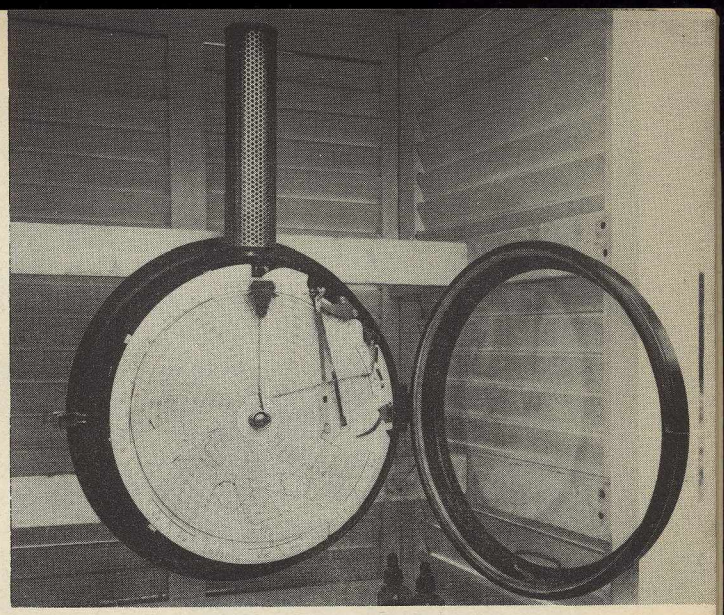
Preliminary examination of the data now available indicates that the problems are much more complex in a limestone terrain than imagined commonly. It is possible to determine with reasonable accuracy the runoff volume accretion to pond storage during intervals of a storm period. It is practically impossible, however, to determine what portion of the surface drainage area contributed surface or subsurface runoff during a specific interval. The infiltration rates and the associated rainfall-runoff relationships are not adaptable to simple mathematical computation. Indirect processes and scientific judgement must be used.

The separation of runoff volume into surface and subsurface components is equally complicated. Complexities involved in the analysis of data from this area of

only six acres causes one to understand why hydrologists dealing with very large drainage areas are still seeking workable answers after so many years of research.

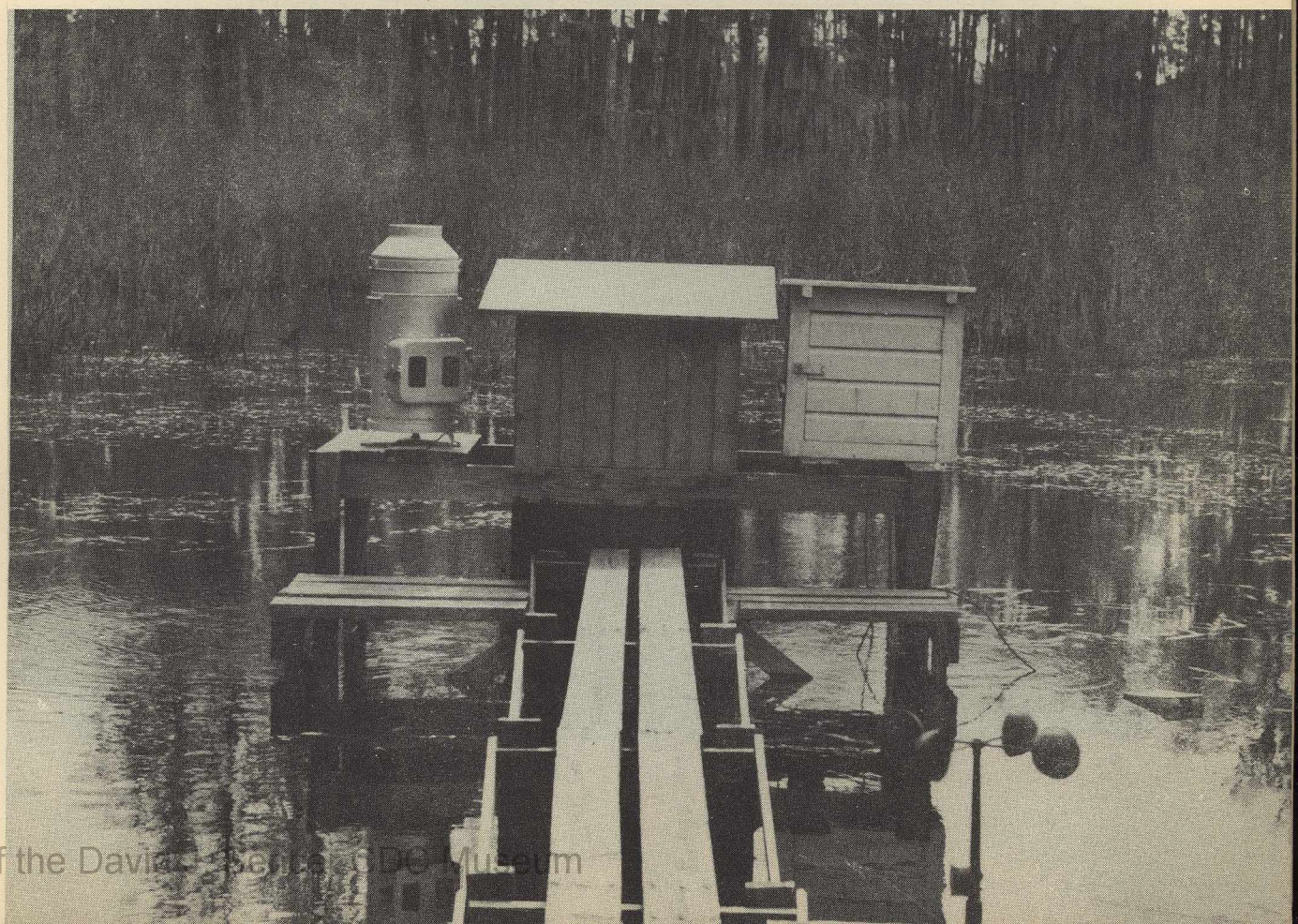
Certain deductions are possible, however, from examination of the data. For example, the reduction in infiltration capacity of soils during the progress of a storm, as determined experimentally by various workers, is valid for this area. The initial infiltration capacity of these soils exceeds 1.5 inches per hour. If the storm continues, a constant infiltration rate of about 0.10 inch per hour is approached. Plottings of total amounts of rainfall against total amounts of runoff for numerous storm periods produce characteristic scatter diagrams. Uniform relationships cannot be demonstrated by application of ordinary statistical procedures. This complex problem cannot be resolved in terms of a few simple variables.

The use of a factor of antecedent soil conditions does show promise. It is believed that approximations of rainfall-runoff ratio employed in the past are not adequate. Even a casual study of the data available indicates that accurate prediction of the runoff component of rain-



Recording hygrothermographs provide continuous records of atmospheric temperature and humidity.

Recent installations in ponds provide instruments for maintaining continuous records of water temperature, wind movement, water level, and precipitation.

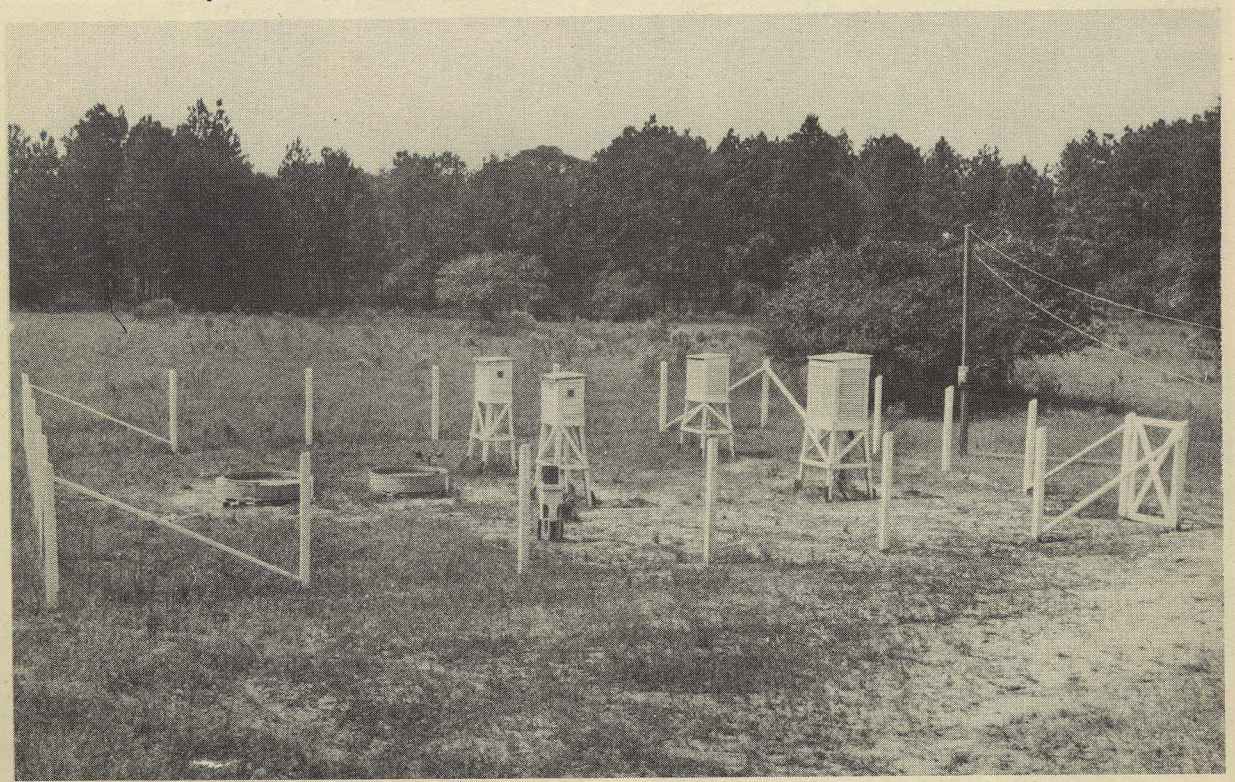


fall requires consideration of antecedent soil moisture conditions, changes in ground-water storage, and a far better knowledge of infiltration characteristics than is extant.

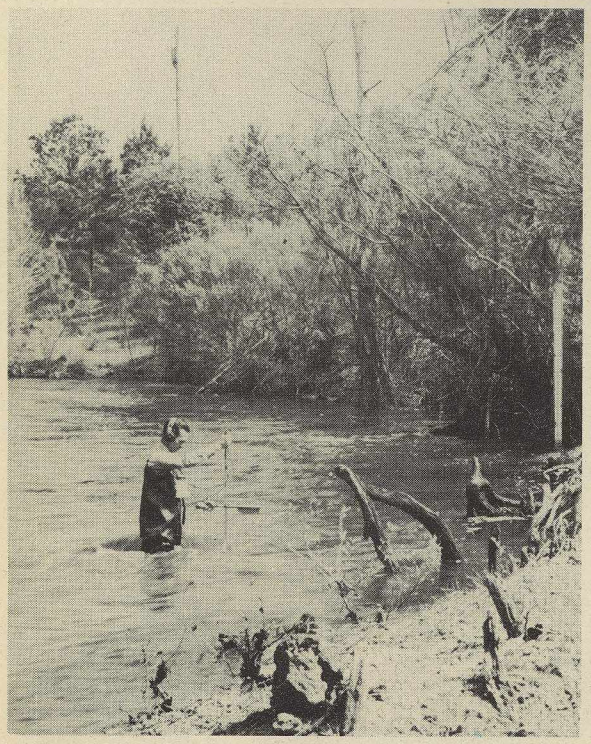
Determination of water balance in a sink-hole pond involves a consideration of water losses. The principal losses from a non-flowing pond are by evaporation, transpiration, and seepage through the bottom. The recession limb of the pond hydrograph indicates the total amount of losses by these methods in a given period. Evaluation of the three principal components depends on computation by indirect methods. It is believed that approximate seepage losses can be determined by observing the rate of pond recession during periods of low evapo-transpiration losses. Such data are obtained during periods of high atmospheric humidity.

An evaporation station is maintained to furnish information for estimating evaporation losses from ponds. Since total loss is known, transpiration loss can be approximated by deducting the amounts of seepage and evaporation. An effort is being made to secure an experimental evaporation rate which will approximate closely evaporation loss from ponds. Evaporation rates are obtained from a standard Class A Weather Bureau pan, and from another pan, identical with the exception that the sides are insulated with rock wool. Maximum and minimum air temperatures, wind movement, surface water temperature in each pan, and relative humidity are recorded with automatic instruments. The cumulative amount of daily wind movement is obtained. Preliminary results from these observations are interesting: For a period of one year, evaporation from the insulated pan averaged 88 percent of that from the standard uninsulated Class A pan. The American Society of Civil Engineers' Sub-Committee on Evaporation of the Special Committee on Irrigation Hydraulics recommends applying a reduction coefficient of 70 per-

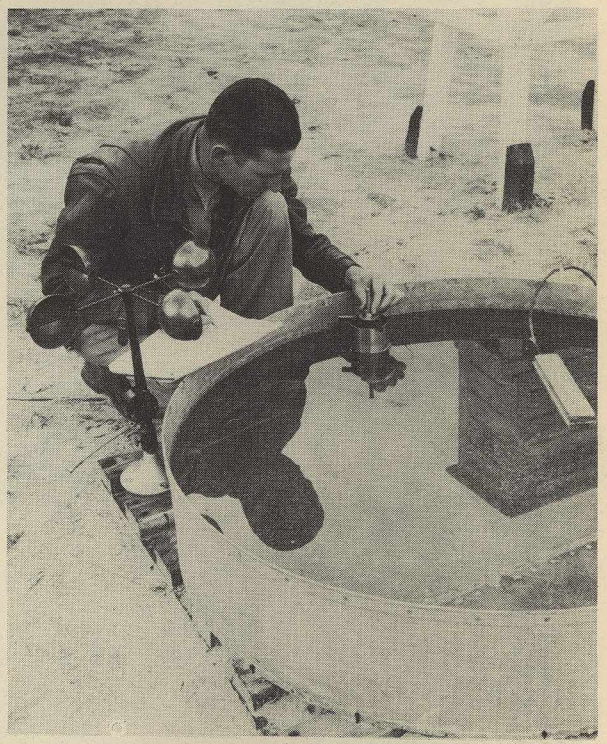
Evaporation station. Instruments in the shelters record temperature of water in evaporation pans (left), and atmospheric temperature and humidity.



Special equipment is used to handle heavy weights necessary to guage flow in large streams. Inserts: (upper left) Close-up of crane used to lower current meter into stream from bridge. (lower right) Close-up of current meter and weight.

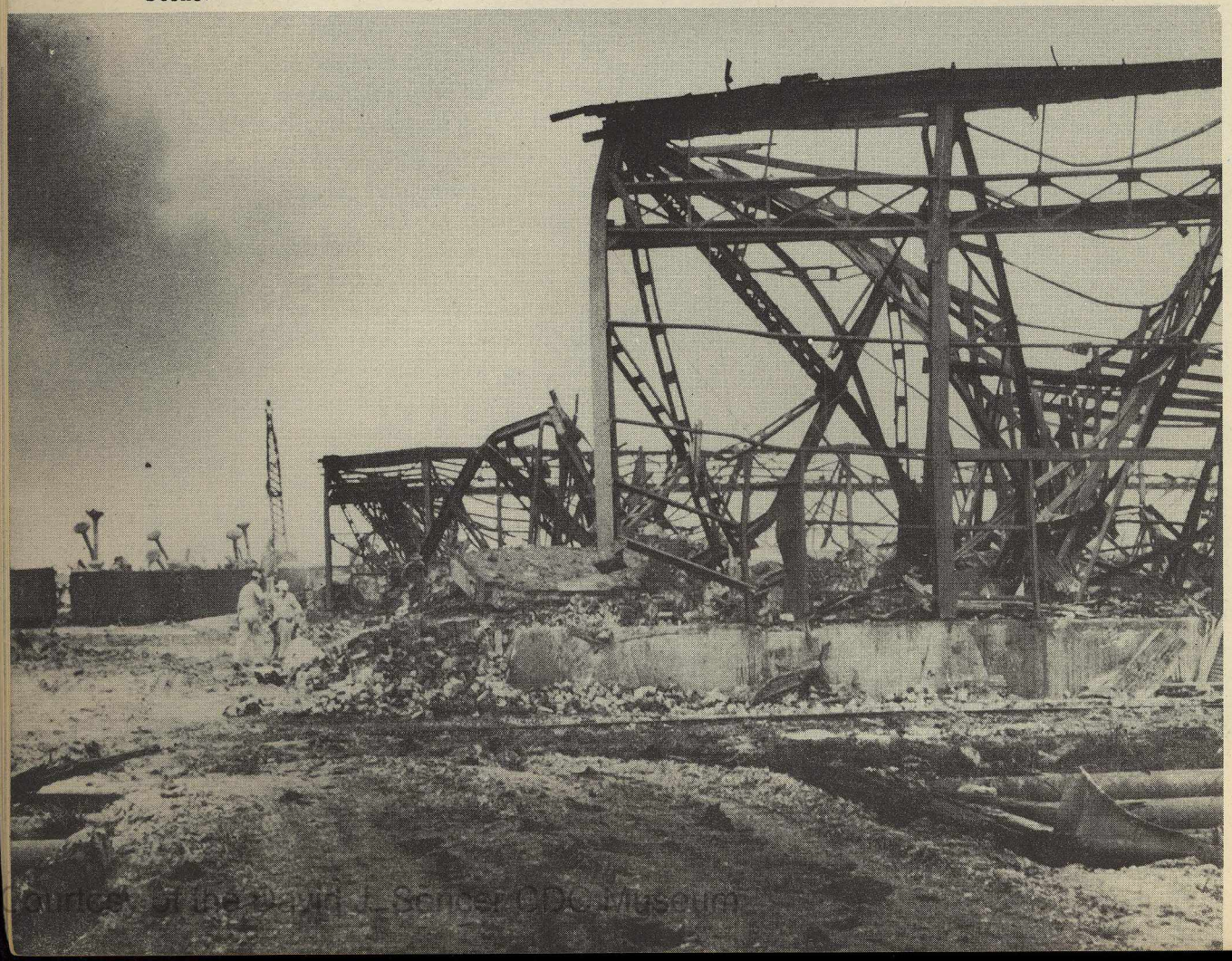


Stream flow measurements of small streams can be made by wading.



Water loss from the evaporation pan is measured with a hook gage. The instrument at left measures the amount of wind movement.

(above left) Blockades were set up by police throughout the area to prevent general entrance into the devastated city (in background) until all danger was past. Blockade shown on dike a mile from the scene of the explosion. (above right) The bow of the French ship, Grandcamp, blown 100 feet away in the explosion, is shown here beside 250-ton barge, Longhorn II. (below) Devastation of warehouse area. View looking north from land side, quarter mile from blast scene.



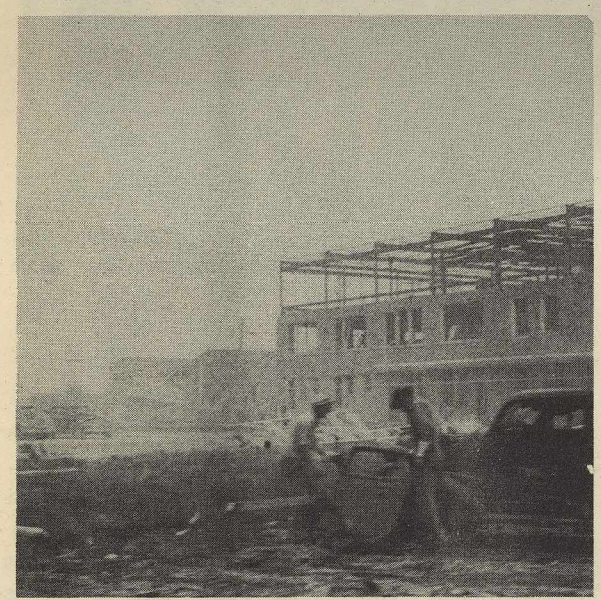
water supply and sewage disposal problems, and the state also sent in a representative of the Vital Statistics Division for death registration.

CDC CREWS UTILIZED

From the first day, CDC typhus control crews and trucks from Houston and Galveston had been working in the area, assisting in rescue and salvage operations. Mr. C. R. Coppage of the State Office in Austin and Mr. William Hendrix of Houston happened to be travelling near Texas City at the moment of the explosion and were able to rush to the scene.

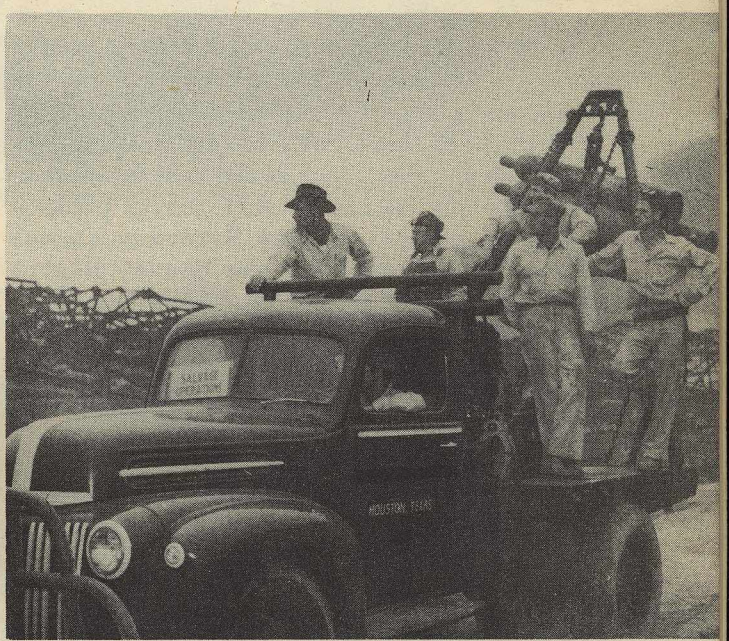
On Friday afternoon, April 18, it was possible to inspect the residential area, where damage ranged from a minimum of broken windows to complete destruction. Fortunately, several blocks separated the residential from the industrial area and only in the first eight or ten blocks nearest the industrial section were most residences completely broken up. On Saturday, April 19, local police authorities gave special permission for inspection of the industrial section where rescue operations were still in progress.

Heavy equipment was brought in to move large objects, and bulldozers were used to cut passages among the debris. The

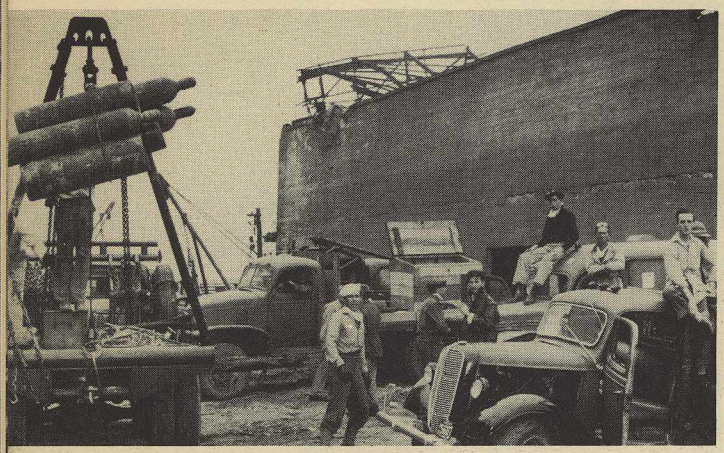


The Monsanto Chemical Company building was completely destroyed.

CDC representative William Hendricks, (Houston) inspecting devastation in Texas City warehouse section.



(above) Salvage operation team in devastated area. (below) USPHS worker spraying with DDT on the site of a demolished dock restaurant 75 yards from the explosion.



Rescue teams at work in Texas City dock area.

Army furnished medical collection crews to carry out bodies on litters, and a large commercial garage was converted into an emergency morgue. Professional undertakers from Houston and Galveston, assisted by about 100 student undertakers, prepared the bodies as well and as promptly as possible, but by Saturday it was necessary to call on the County Health Officer to lend a hand in caring for them. Mr. Gilbertson offered the assistance of the Public Health Service in underwriting any needed supplies, and the County Health Officer accepted, requesting large quantities of lime and heavy duck material.

County health workers. These workers came from miles around to assist in rescue work.

The bodies were worked over by crews from the Bureau of Identification of the State Police. Records were made of approximate weight, height, and clothing worn, after which each body was placed in lime and then encased in heavy ducking, with lighter removable covering placed over the heads to allow further identification. Dentists were recruited to make a chart of the teeth of each body. Later, each body was dipped first in a tank of white gasoline, and then into another tank of formaldehyde. At the end of a week, about 421 bodies were recovered and 295 persons were missing. Out of the 421 recovered about 100 were unidentified. The total loss of life was between 600 and 700. A commission appointed by the Mayor of Texas City and headed by the County Sheriff had the responsibility of seeing that no body was removed without authority.

Nurses from afar came to assist in treating the injured. Several Chicago nurses shown here with local county health officer.

ASSISTANCE TO WOUNDED

Dr. Smillie, of the Communicable Disease Center, was sent to aid in the care of the wounded at nearby Camp Wallace. A campaign had been conducted in the area before the disaster for smallpox, typhoid, and diphtheria immunization, which was fortunate. Plans were made for tetanus vaccinations among the injured as it was found necessary.

After the PHS-CDC group had assisted in the emergency rescue activities during the first few days, they were released for sanitation work. Power and hand sprayers were brought in and DDT spraying was done in selected locations where fly breeding was potential. Near the docks were large warehouses which had been filled with beef, flour, grain, and other foodstuffs. This area was treated with sufficient DDT spray to give a good residual. In the business district, front and rear entrances of all restaurants were sprayed, as windows and screens had all been blown out.

(upper) These remains of a Piper Cub plane, which was flying over Texas City at the time of the explosion, were found 700 yards from Grandcamp. (lower) Mr. Hendrix and Mr. Gilbertson, of CDC, supervising State Health Department workers fill sprayers with DDT spray emulsion.

CDC BEGINS SANITATION WORK

By April 23 arrangements had been made for spraying by airplane. An agricultural treatment concern

at Beaumont, Texas, did the work with 25-percent concentrate at a dosage rate of one-half to one pound per acre. It was believed that about three additional spraying operations would be necessary.

It was determined that the most logical manner in which the Public Health Service could give assistance would be through a sanitation section developed in the county health unit. Mr. D. J. Schliessmann, of the Columbus Training Station, was installed as head of this section, assisted by Mr. Silas Lacy, and plans were made to employ three sanitarians — one on food and milk, one on general insect control, and one on general sanitation. An adequate number of laborers and labor foremen were authorized to set up an "insect sanitation" program. This plan was heartily approved by the Texas State Health Officer and State Sanitary Engineer. The County Health Officer turned over his sanitation problems to Mr. Schliessmann.

PATTERN FOR FUTURE EMERGENCIES

The aid furnished by the Public Health Service in this disaster may develop a pattern for such work in future emergencies. Volunteer help is usually available in the first few days of such a disaster. The rehabilitation period, after such assistance has dispersed, is the time when local authorities begin to have their heavy problems, and it is felt that Public Health Service assistance would be then most valuable. The type of disaster would, of course, govern the type of aid given. The pattern would be reviewed and approved by the Conference of State and Territorial Health Officers, and would be coordinated with disaster relief agencies such as the American Red Cross. Such activities in disaster and epidemic areas might continue for several weeks.

Memorial services were held for all those who lost their lives in Texas City disaster.

INTESTINAL PARASITE SURVEY CONDUCTED IN TEXAS

SURVEY BEGUN

In March an intestinal parasite survey for carriers of amoebic dysentery was conducted in connection with the Dysentery Control Project in Texas. Up until that time, the Dysentery Control Project had been concerned with investigating the importance of flies in the transmission of bacillary dysentery. This survey was performed to determine the effect of fly control on the incidence of *Endamoeba Hystolitica,* the etiologic agent of amoebic dysentery.

Dr. M. M. Brooke and Mr. Morris Goldman, of the Laboratory Division, assisted by Mr. Burgess, of the Virus Branch in Montgomery, Alabama, carried on the survey. All major contacts were made with or through Dr. James Watt, Officer in Charge of the Dysentery Control Project, at Pharr, Texas. Dr. Watts' staff also arranged for the collection of specimens.

SURVEY LAB SETUP

The survey was begun on March 4 and completed March 20. A laboratory was established at the Weslaco City Hall, about 16 miles from Pharr. Two villages, Mission and Edinburg, Texas, in the Rio Grande Valley, were chosen for the work. At the suggestion of the survey team, they were not informed until the survey was finished that Edinburg was the village in which flies were being controlled with DDT, and that Mission was an untreated area.

It was estimated that approximately four-fifths of the cartons distributed were returned containing stool specimens, and 518 stools from each village were examined. Tabulations of these examinations are as yet incomplete.

The work was organized so that two members of the group remained constantly at the microscopes examining direct smears, while the third prepared the direct specimens, filled out the survey cards, and took care of those specimens indicated by the microscopists as requiring further handling. This additional handling included staining slides for identification of organisms, staining slides for class use, preserving specimens in formalin, preparing PVA (poly-vinol-alcohol) mounts, and assorting specimens for preservation by freezing. A " Key sort " type card, prepared by the Service Unit, was used to keep the record of the various activities and to obtain a running account of the percentages of the various parasites.

ROUTINE ESTABLISHED

The routine established for examination of stools was as follows: the saline and iodine smears were examined microscopically for a maximum of ten minutes. At the end of the ten-minute period, if identification of the encountered parasites was still in question, a hemotoxylin-stained fecal smear was requested. This stained smear

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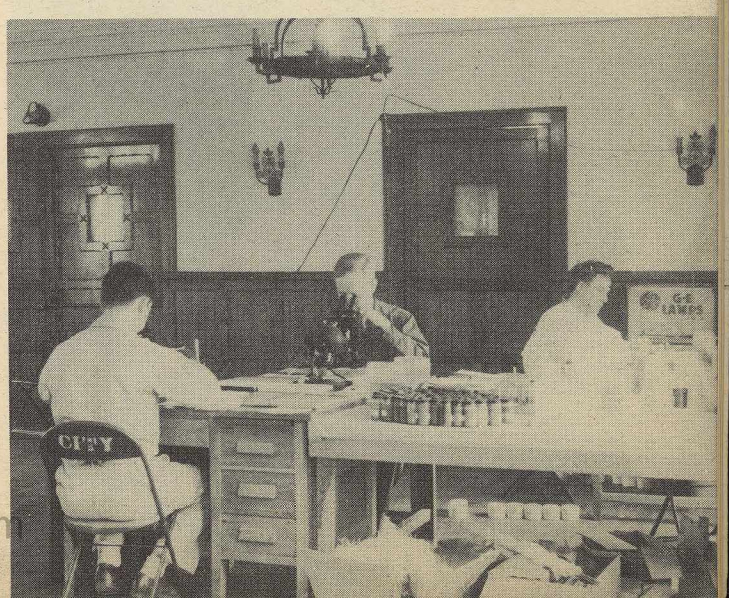
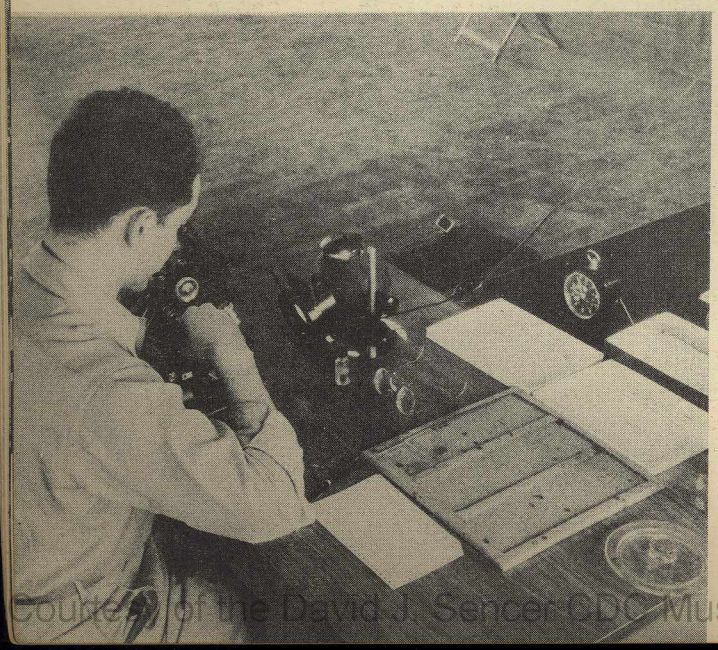
Temporary laboratory facilities set up in Weslaco City Hall for parasitology team (Laboratory Division) surveying for carriers of amoebic dysentery.



Preparation of saline and iodine fecal smears for examination for intestinal parasites. A survey card (lower left) is made out for each slide.

was examined for a maximun of 15 minutes, after which the examination of the specimen was considered concluded, even though identity of the organism might still be undetermined. Actually, after this procedure, only five specimens contained organisms which could not be identified definitely. Only unquestionable organisms were recorded for the final diagnoses. It was recognized that this routine undoubtedly failed to reveal or identify the maximum number of organisms which might be found in one normally passed stool. However, establishment of strict standards was necessary to make possible comparison of the percentages of infections in the two villages.

Microscopical examination of saline and iodine smears for intestinal parasites. Observed parasites are recorded on survey cards.

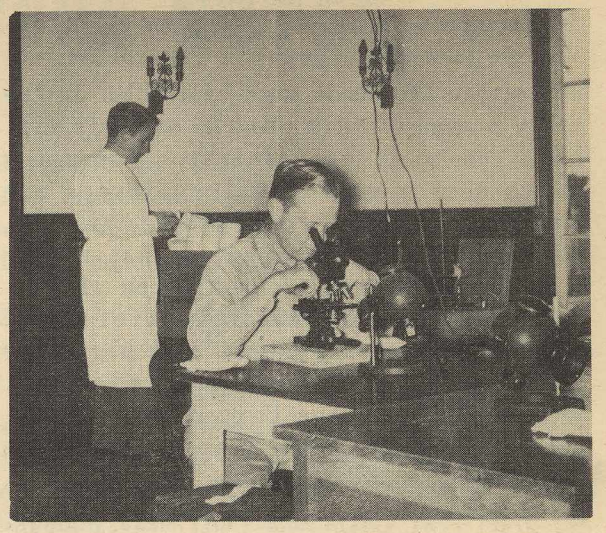


TIME RELATIONSHIPS

The following time relationships were noted, and may be helpful in estimating the time necessary for future surveys: An hourly check revealed that the number of specimens examined per hour ranged from 8 to 14, depending upon difficulties encountered and length of interruptions. Thus, the examination of each specimen required approximately 7.6 minutes. Inasmuch as three individuals were continuously

Survey specimens being stained or preserved for further study at CDC Headquarters Laboratory.

engaged in the work, a total of 396 man-hours was consumed and an average of 22.9 man-minutes was devoted to each specimen. In addition, approximately two hours were required to set up the laboratory, and it required two persons working approximately two days to examine the remaining hemotoxylin smears which were prepared and brought back to Atlanta for checking the diagnosis of the specimens.



Laboratory setup for survey.

ADVANTAGE OF PROGRESSIVE STAIN

The experience on this survey demonstrated the advantage of using a progressive stain - which in this instance was the picric acid hemotoxylin technique developed by the CDC Laboratory. Such a stain can be employed for diagnostic purposes and for collecting stained slides for class use. Had it been necessary to use a hemotoxylin technique requiring differentiation (destaining), the work would have been greatly complicated and would have required a much longer time.

FEDERAL EMPLOYEE HEALTH

Enactment of Public Law 658 by the 79th Congress made possible the establishment of a preventive medical program for Federal employees. Heads of departments and agencies of the Federal Government including Government-owned and-controlled corporations, after consulting with the Public Health Service and after consideration of its recommendations, may establish employee health programs for the purpose of promoting and maintaining the physical and mental health of the employees of the Federal Government.

For many years the Service made studies of specific industrial and occupational hazards and has furnished professional advice upon request to private industry and to agencies of the Federal Government. Many industrial organizations and commercial establishments have found that employee health programs have paid dividends in increased efficiency and productivity. It is anticipated that a preventive medical program operated by the several Federal departments and agencies should prove of great value in helping employees to perform their assigned duties efficiently and economically.

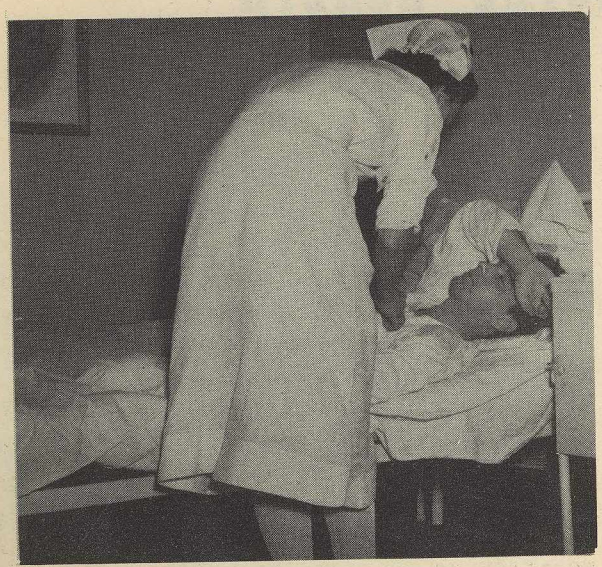
An appropriation has been passed by Congress to enable the Public Health Service to begin a limited program of activity as provided by Public Law 658.

It is expected to develop a plan for a preventive medical program for Federal employees within the funds made available. In the early stages of this program emphasis will be given to it in Washington because a large number of Federal employees are concentrated there. In extending this plan to the field it is expected that two or more areas outside of Washington will be selected for the development of field programs during the fiscal year beginning July 1, 1947. Further expansion of this work throughout the United States will depend upon the funds made available by Congress for this purpose.

PUBLIC LAW 658

Public Law 658 – 79th Congress is quoted below:

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That, for the purpose of promoting and maintaining the physical and mental fitness of employees of the Federal Government, the heads of departments and agencies, including Government-owned and-controlled corporations, are authorized, within the limits of appropriations made available therefor, to establish, by contract or otherwise, health service programs which will provide health services for employees under their respective jurisdictions: *Provided,* That such health service programs shall be established only after consultation with the Public Health Service and consideration of its recommendations, and only in localities where there are a sufficient number of Federal employees to warrant the provisions of such services, and shall be limited to (1) treatments of on-the-job illness and dental conditions requiring emergency attention; (2) preemployment and other examinations; (3) referral of employees to private physicians and dentists; and (4) preventive programs relating to health: *Provided further,* That the health program now being conducted by the Tennessee Valley Authority and by the Panama Canal and Panama Railroad Company shall not be affected by the provisions of this Act: *And provided further,* That such health programs as are now being conducted for other Federal employees may be continued until June 30, 1947. The Public Health Service, when requested to do so, shall review the health service programs being conducted by any department or agency under authority of this Act and shall submit appropriate comment and recommendations. Wherever the professional services of physicians are authorized to be utilized under this Act, the definition of "physician" contained in the Act of September 7, 1916, as amended (U.S.C., 1940 edition, title 5, sec. 790), shall be applicable. Approved, August 8, 1946."



Employee health programs pay dividends in increased efficiency.

HEADQUARTERS NOTES

WASHINGTON VISITORS

Dr. J. W. Mountin, Chief of the States Relations Division, visited CDC Headquarters for several days in May.

Mr. Lyman Moore, of the Bureau of the Budget, arrived in Atlanta on June 16 to make a 10-day review of CDC activities.

Visitors to Headquarters during April included Messrs. Edward B. Kelly, and Kenneth Miller, of the FSA budget office, and Messrs. Harry S. Doran and Charles W. Woodard of Mr. Harlow's office. These representatives from Washington were in Atlanta to look over some of the fiscal and budgetary practices of CDC and to determine if the Center will assume increased responsibility in this connection.

ROCKEFELLER HEAD VISITS CDC

Dr. George Payne, of the Rockefeller Foundation, visited CDC Headquarters in April to arrange a schedule for the foreign group to be sent to Atlanta for training. An arrangement is to be made that will enable visitors to come in planned groups rather than singly.

LAWSON SPACE FOR CDC T. B. LABORATORY

Work began in April on the refurnishing of buildings at Lawson General Hospital at Chamblee, Ga., to house the T.B. Research Laboratory.

SURVEY IN PUERTO RICO

Dr. Justin A. Andrews and Mr. Frank Tetzlaff left Atlanta June 10 for Puerto Rico to make an "on-the-site" appraisal of the feasibility of anopheline albimanus eradication on the Island of Vieques, near Puerto Rico, if it is determined that this particular species of *Anopheles* will yield to eradication techniques.

SMALLPOX VACCINATIONS

In accordance with notice from the Surgeon General's office the CDC Clinic made preparation to vaccinate any CDC employee desiring to take the vaccine for smallpox. Approximately 1000 dosages were available for vaccination of headquarters and field personnel.

REQUEST FOR EPIDEMIOLOGICAL ASSISTANCE

The Orient State School in Ohio made a request through the State Health Officer to the CDC Laboratory Division for epidemiological assistance, and three persons from the Laboratory were sent to the school about the first of May to make stool examinations. Plans were made to examine a group of about 500 both parasitologically and bacteriologically, rather than examine all the population. About 400 persons have already been examined by three Ohio State Health Department employees who took the CDC training course previously.

ORIENTATION PROGRAM FOR NEW OFFICERS

An orientation program for new officers was held in Washington beginning June 9, and the CDC Training Division was requested to assist in planning the course.

The Division of Commissioned Officers issued to those attending a bulletin on the rights, duties, and responsibilities of the Service officer, which was prepared by the CDC Editorial Branch.

Four persons from CDC attended the presentation, representing the medical engineering, production, and training aspects of the Center.

TRAINING AT GA. TECH.

The Communicable Disease Center is to assist Georgia Tech in a training program on Industrial Hygiene, beginning July 1, 1947.

EDITORIAL BRANCH MOVES

The Editorial (Reports) Branch of the Library and Reports Division was moved on June 6 to occupy quarters in the Ginn

PERSONNEL BRIEFS

On June 16 Entomologist Frank W. Fisk, former commissioned officer, returned to duty and was assigned to Kentucky.

Martin Frobisher, Jr., of Baltimore, Md., was appointed in May to act as Consultant Bacteriologist.

Henry Greene, Typhus Control Specialist, was transferred from Atlanta to Macon, Georgia, as of April 1.

Peter Skaliy, Biologist, entered on duty April 28, in the Technical Development Division, Savannah, Ga.

Merle I. Wimmer was appointed chief of the Utilization Branch, Production Division, on May 5.

Morris Berg, of Framingham, Mass., returned to duty as Entomologist on June 14.

Robert E. Shackleford was appointed April 21 as Carto-graphic Engineer in the Service Branch of the Administrative Division.

George W. Reid, instructor at Georgia Tech, was appointed as consultant in the Training Division June 13.

Richard S. Black became Chief of the Production Branch, Production Division, on May 4.

Charles D. Grant was appointed Entomologist at Berkeley, California, June 16.

Paul L. Guptill was appointed as Parisitologist on June 2, to serve in the Laboratory Division at Headquarters.

Cornelius W. Kruse, was appointed as Special Consultant in Engineering at Baltimore, Maryland, on June 9.

Robert S. Stenburg was appointed on April 6 as Mechanical Engineer in the Technical Development Division at Savannah, Georgia.

Phillip B. Nations was transferred on April 20 from the Headquarters Personnel Branch to the Production Division as Project Supervisor.

Entomologist James W. Cunningham was transferred in June from Jefferson City, to Clarkston, Missouri.

Dr. Michael H. Elias became a Project Supervisor in the Production Division in May.

Ernest G. Myers was appointed June 23 as Entomologist at Berkeley, California.

Harry A. Sherrill was appointed June 16 as Project Supervisor in the Production Division.

Sanitary Engineer William B. McMurtray transferred in April from Jacksonville, Fla., to serve in the Impounded Water Branch of the Engineering Division, Atlanta Headquarters.

Consulting Biologist Harold Trapido was appointed on June 4 at Panama City, Panama.

Entomologist Carl O. Mohr was appointed to the Engineering Division, Headquarters Office, in June.

Jules Fine was appointed Entomologist at Berkeley, California, June 16.

Mr. E. S. Tisdale and Dr. Seward E. Miller were on the program of the Southern Branch of the APHA meeting in Memphis, April 21.

NEW BOOKS IN THE LIBRARY

Recent publications and new editions received in the Library during the quarter include the following:

Aberle, Sophie Bledsoe de, "Primate Malaria".

Adlam, T. N., "Radiant Heating".

Anderson, A. v. K., "Essentials of Physiological Chemistry".

Bartlett, R. W., "The Milk Industry".

Bartsch, Paul, "Schistosomophora in China".

Bennett, Harry, "Practical Emulsions".

Benoit-Levy, Jean, "The Art of a Motion Picture".

Burnet, F. M., "Virus as Organism".

Chase, Gilbert (ed.), "Music in Radio Broadcasting"

Cooper, G. H., "Building Construction Estimating".

Cork, James M., "Radioactivity and Nuclear Physics".

Cramer, Harold, "Mathematical Methods of Statistics"

Cushny, Arthur Robertson, "Pharmacology and Therapeutics".

Dale, Edgar, "Audio-visual Methods in Teaching".

Dawes, Ben, "The Trematoda".

Day, Mary A. C., "Basic Science in Nursing Arts".

Dent, Ellsworth Charles, "Audio-visual Handbook".
Faraday, J. E., "Encyclopedia of Hydrocarbon Compounds".
Fash, Bernice, "Body Mechanics".
Fuson, Reynold C., "A Brief Course in Organic Chemistry"
Greaves, J. E., "Elementary Bacteriology" 5th ed.
Grollman, Arthur, "Essentials of Endocrinology".
Hoban, Charles F., "Movies that Teach".
Hoelscher, R. P., "Industrial Production Illustration".
Jamieson, Edward Bald, "Illustrations of Anatomy for Nurses".
Joslin, E. P., "Treatment of Diabetes".
Kahn, Fritz, "Our Sex Life" 2nd ed.
Kingzett, C. T., "Chemical Encyclopedia".
Kudo, Roksabro, "Protozoology".
Leary, James C., "DDT and the Insect Problem".
Mackie, Thos. J., "Handbook of Practical Bacteriology" 7th ed.
Mannino, Philip, "ABC's of Visual Aids and Projectionists' Manual".
Maugh, S. C., "Statistically Indeterminate Structures".
McCleary, Robert A., "Call Me Doctor".
McCullough, C. B., "Engineer at Law".
McDonald, P. B., "Personality and English in Technical Personnel".
Moersch, F. P., "Neurology and Psychiatry for Nurses".
Moore, J. E., "Penicillin in Syphilis".
National Foundation for Infantile Paralysis, "A Bibliography of Infantile Paralysis".
Osborne, Wm. A., "Elementary Practical Biochemistry".
Pantin, C. F. A., "Notes on Microscopical Technique for Zoologists".
Pringsheim, Peter, "Luminescence".
Robinson, Victor, "Victory over Pain".
Rogers, Ernest, and Muir, Ernest, "Leprosy".
Sadler, William Samuel, "Mental Mischief".
Schreiber, R. E., "Building an Audio-visual Program".
Smith, E. S. C., "Applied Atomic Power".
Stokley, James, "Electrons in Action".
Stokley, James, "Science Remakes our World".
Solomon, Arthur K., "Why Smash Atoms?"
Southern Building Code Congress, "Southern Standard Building Code".
Sutheim, G. M., "Introduction to Emulsions".
Sutton, G. E. F., "Aids to Medical Diagnosis".
Tracy, J. C., "Surveying, Theory and Practice".
Tugwell, Rexford G., "Stricken Land; The story of Puerto Rico".
U. S. Bureau of the Census, "Statistical Abstract of the U. S."
West, T. F., "DDT, the Synthetic Insecticide".
White, P. D., "Heart Disease".
Williams, Roger J., "The Human Frontier".
Young, C. B. F., "Surface Active Agents".
Zworykin, V. K., "Electron Optics and The Electron Microscope".

TECHNICAL DEVELOPMENT DIVISION INVESTIGATIONS

CURRENT DEVELOPMENTS IN ANOPHELINE LARVICIDING

Since preliminary investigations in 1946 indicated that DDD (dichloro diphenyl dichloroethane) was actually as effective as DDT for the control of anopheline mosquito larvae and it appeared to be less toxic to other aquatic biota, comparative studies are being continued with these two materials. In many of the tests made in previous years with DDT applied at the rate of 0.05 lb per acre the larval mortality was extremely high. Therefore, it was thought that lower dosages would more clearly show any possible difference between the two materials. In tests made with DDD and DDT at less than 0.05 lb per acre the results had been very erratic in the different plots. By computing the average larval mortality twenty-four hours after treatment from the combination of all applications of each material, the results seemingly indicate that DDD may be slightly more efficient than DDT; however, due to the great amount of variation between plots, this is of doubtful significance. All the evidence acquired to date indicates that DDD is fully as adequate as DDT for

anopheline larviciding. Some further evidence is needed to support previous indications that it is less toxic to wild life.

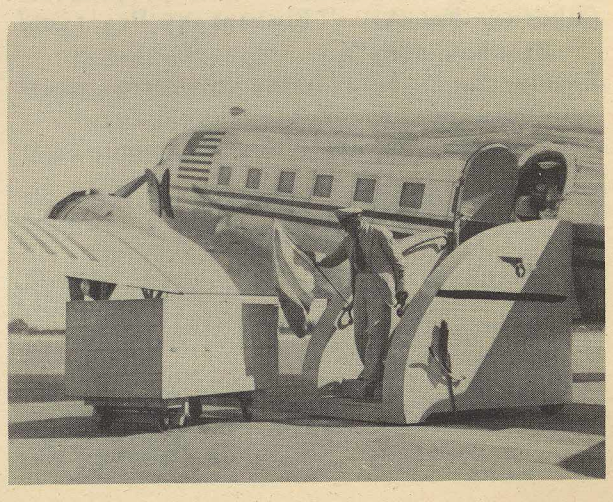
Further studies on the effects on wild life of the routine application of DDT larvicide by airplane are being carried on the same plots used in 1946. These plots are located in the Savannah Wild Life Refuge which was made available for this experimental work by the U. S. Fish and Wild Life Service. In general, insects seemed to be much less abundant in the entire area this year than they were during 1946. That fact may explain the observation of many less dead insects on the sprayed plot than was expected on the basis of observations in 1946. Although slightly more minnows and small fish have been found dead in the sprayed pond than was true last year, the fish kills are not sufficiently high to be of significance as yet.

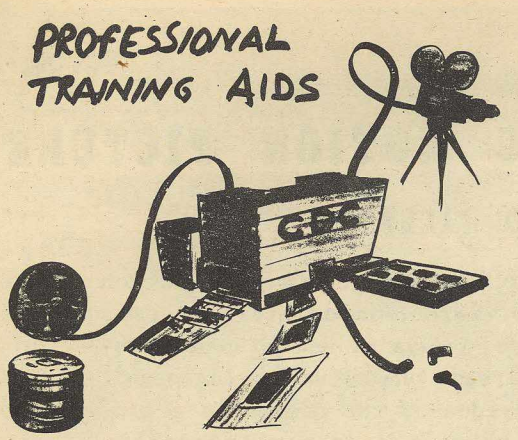
COMPARISON OF DDT AND CHLORDANE FOR RESIDUAL SPRAY TREATMENT

To determine the comparative effectiveness of different dosages of DDT and chlordane applied as residual spray treatments in houses, a series of thirty unoccupied bedrooms in an abandoned housing project were treated and will be tested periodically by releasing insectary-reared adult *A. quadrimaculatus* mosquitoes in them. These housing units were all of concrete block construction, the interior walls of which were painted several years ago. Tests are being confined to the bedrooms which are of uniform size and structure throughout the project. The first tests in these rooms were conducted approximately 1½ months after treatment. Dosages ranged from 200 to 800 mg of DDT or chlordane per square foot and because of the relatively high dosages, the results of the first tests are not very conclusive. As the treatments increase in age, any significant differences in them may be expected to be revealed. However, more or less accidentally, these first tests revealed the interesting fact that chlordane acts as a fumigant. To verify this, two samples were taken from each of three cages of mosquitoes, one sample from each being held in a housing unit where no treatments had been made and the others being placed in a screen cage on a table in the center of rooms treated with 200, 400, and 800 mg of chlordane per square foot respectively. Complete kills were obtained in the 800 mg room in two hours and in the 400 mg room in two and one-half hours. In the 200 mg room, the males and fifty-three percent of the females were killed within four hours, and ninety-four percent of the females were dead at the end of five and one-half hours of exposure. There was no mortality in the three sample tests in the untreated house. This phenomenon probably accounts for the more rapid knock-down which this insecticide gave in most of the initial tests.

One series of rooms was treated during the spring and early summer of 1946. The effectiveness of the treatments was tested throughout the summer and fall of 1946 by periodically releasing insectary-reared mosquitoes in the rooms. Similar releases were made in the spring of 1947 after the treatments were nearly one year old. In these tests all of the DDT applications continued to produce high mortality while chlordane and other treatments had become relatively ineffective. Of the two chlordane formulations tested the kerosene emulsion apparently retained a higher degree of effectiveness than did the xylene emulsion.

USPHS Aircraft Quarantine Service





ARKANSAS' UNWELCOME GUEST. A 35 mm. sound, black-and-white film strip of 58 frames produced at the request of the State Health Department of Arkansas. It portrays the *Anopheles* mosquito as a transmitter of malaria and gives an account of the development of the mosquito. It teaches methods of mosquito control as a means of controlling malaria. This film is designed for sub-technical audiences. Running time 12 min. Production number 5-083.0

MALARIA - HOW TO STOP IT. A 35 mm. silent film strip, black and white, 25 frames. This film was designed to show what the individual can do to protect himself against malaria. Some basic facts about malaria transmission are presented. This film would be of interest to sanitarians, nursing personnel in local health departments, and sub-technical groups. Production number 5-088.8.

SANITARY DESIGN OF DRINKING FOUNTAINS. A 35 mm. silent film strip, in black and white, 53 frames. A film strip designed to show the features necessary to make a drinking fountain incapable of transmitting disease. Improperly designed fountains are also shown and their faults are pointed out. Titles combined with the pictures make the film self-explanatory but also permit its use as the basis of a lecture on the subject. The film is of interest to public health workers and sanitary engineering schools. Production number 5-081.0.

AIRCRAFT QUARANTINE. A 16 mm. sound, color film with a running time of 16 minutes. A documentary film produced in cooperation with the Division of Foreign Quarantine. Presentation is primarily straight photography and shows four lines of defense against importation of disease-bearing insects and rodents. The method of inspection, insectization, and fumigation is shown in detail. Touches on relations between quarantine officers and aircraft operators. Passenger medical inspection is shown briefly. The film is of interest primarily to inspection and quarantine personnel. Production number, 4-045.0.

HYDRAULIC DREDGING. A 16 mm. sound movie in color with a running time of 5 minutes. A documentary film of MCWA showing how a hydraulic dredge was used to deepen and clear a large marsh area in Florida. Of interest to health training, including sanitary engineers, city and county commissioners. Production number, 4-044.0.

EDUCATION IN MALARIA CONTROL. A 16 mm. sound motion picture, black and white, with a running time of 5.5 minutes. A film designed to show a method of dissemination of information, from the state to the individual, on all communicable diseases, using malaria as an example. The film is of sub-technical nature and would be of interest to health educators for instructional purposes. Production number 4-010.0.

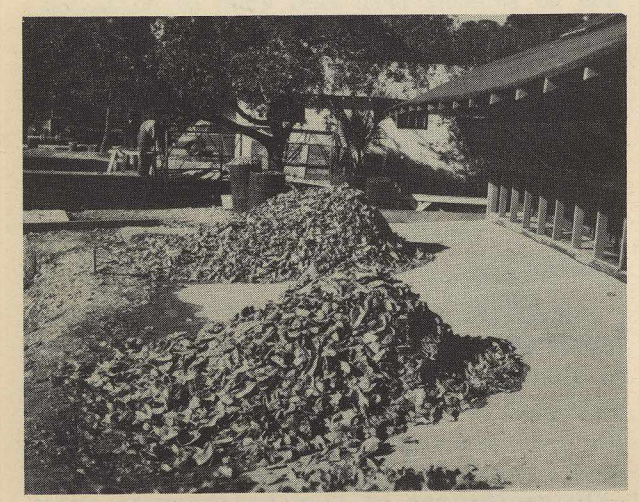
SANITARY LAND FILLS. This 16 mm. sound motion picture in color with a running time of 18 minutes portrays sanitary and economical methods of garbage and refuse disposal. The film shows how to select sites for sanitary land fills and how to prepare trenches. Trench depth, width, filling the trench, compacting the garbage and refuse and covering with dirt are all shown in straight photography. The equipment used is shown in operation. The film is of interest for sub-professional and professional personnel, sanitarians, federal, state, county and city health departments. It should be used for cities with a population up to 200,000. Production number, 4-052.

PICTORIAL REVIEW - CDC MOTION PICTURE:

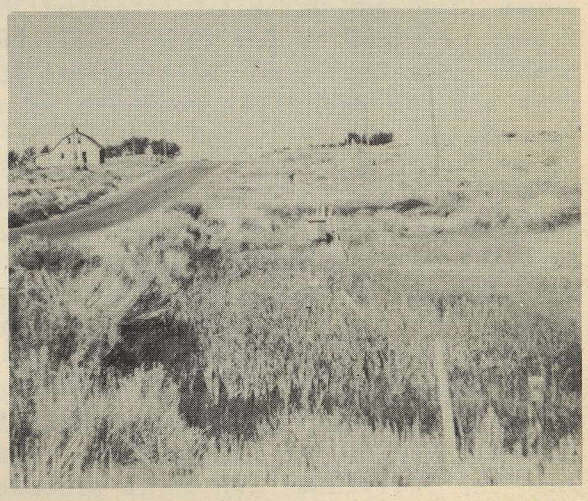
"SANITARY LAND FILLS"

Almost everyone who sees this excellent color training motion picture, released by CDC Production Division, immediately becomes sold on "burying" garbage. Indeed, in these days of health consciousness the subject of refuse disposal is already one of universal appeal.

These black-and-white shots give an idea of the picture's effectiveness, but the color photography makes the film outstanding. Reaction undoubtedly will be enthusiastic in the training field.

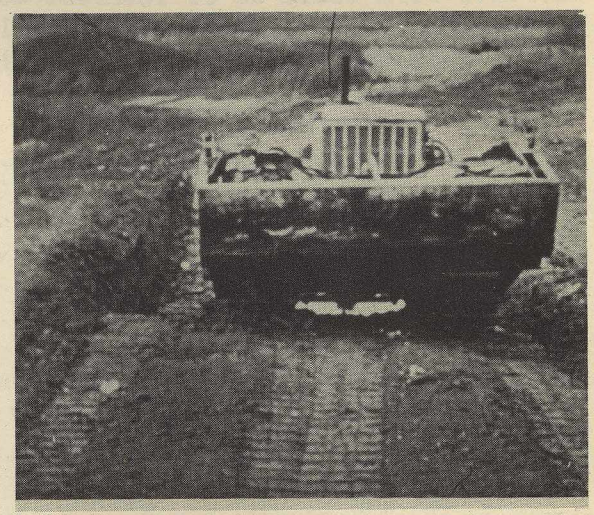


(1) Economical and proper garbage and refuse disposal is a problem for every city.



(2) Some cities choose to dispose of garbage and refuse by use of the sanitary land fill method, by using waste land.

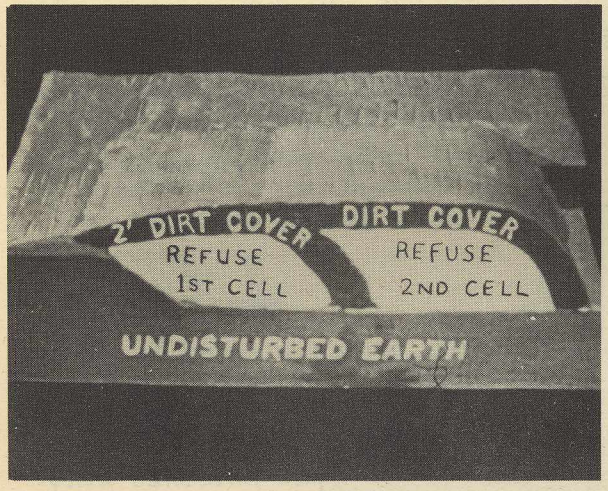
(3) A site with natural drainage and suitable accessibility is selected by the sanitary engineer and properly surveyed.



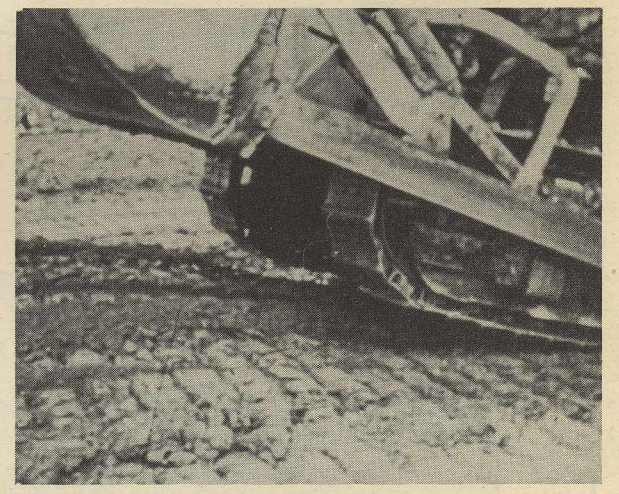
(4) A trench three to six feet deep is dug about one and one-half times the width of the bulldozer to afford good compaction.

(5) Hauling should be done in covered trucks when possible. Selective dumping is important for good compaction.

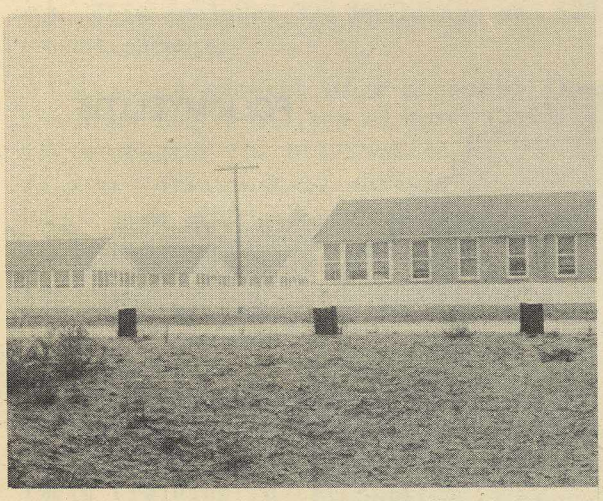
(6) The refuse is compacted with heavy equipment. Complete and thorough compaction is essential.



(7) A dirt covering two feet deep is added and compacted.



(8) Sealing of each cell cuts off escape of rodents and acts as a firebreak in case the rubbish catches fire in one cell.



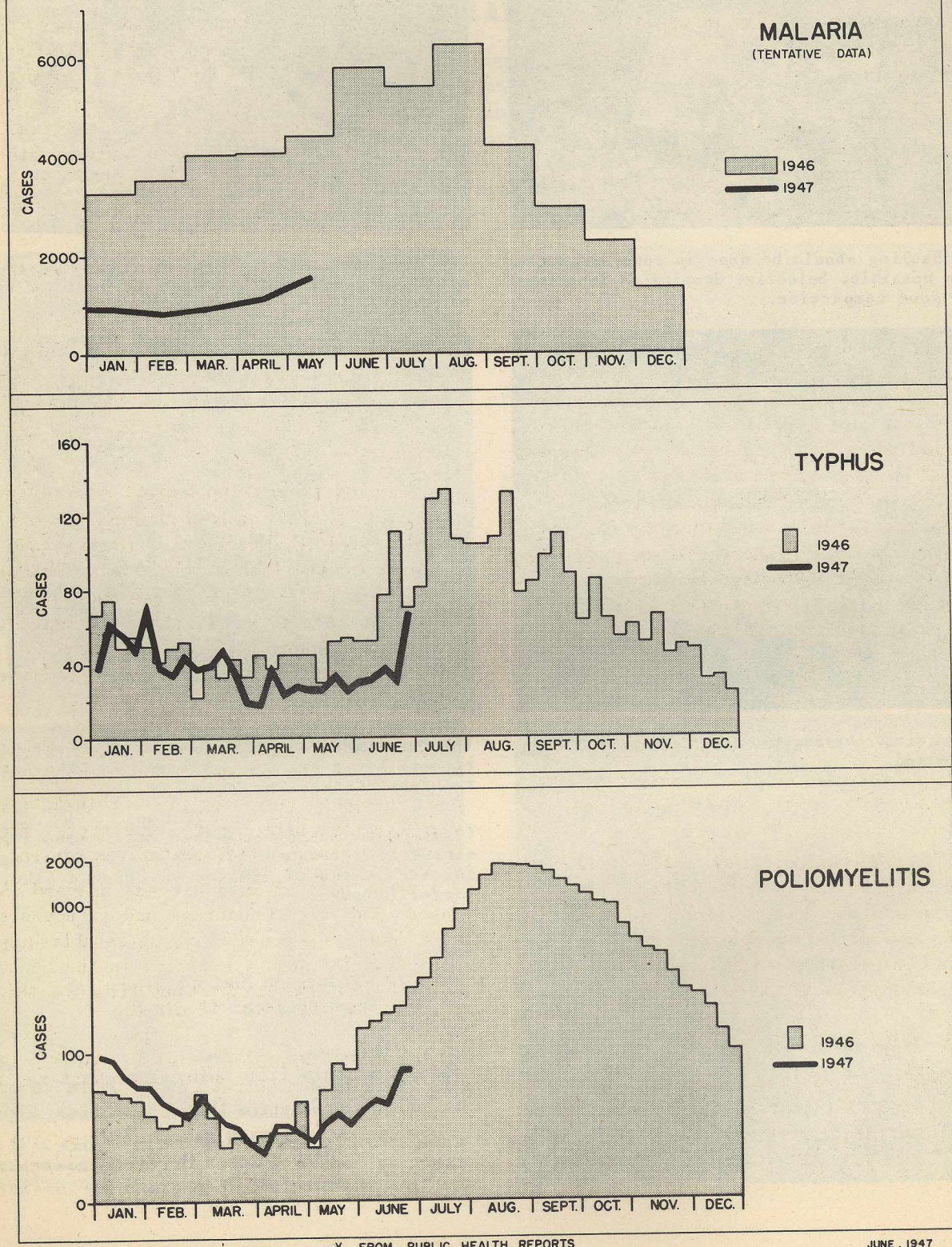
(9) *(left)* Reclaimed waste land can be used for airfields, recreation grounds, building sites for structures of limited weight and other useful purposes.

Production Number: 4-052
Running Time: 18 minutes

To obtain this film, address request to:

Production Division
Utilization Branch
605 Volunteer Building
Atlanta 3, Georgia.

MORBIDITY TOTALS FOR THE UNITED STATES *
MALARIA, TYPHUS, POLIOMYELITIS



USPHS - CDC ATLANTA, GEORGIA * FROM PUBLIC HEALTH REPORTS JUNE, 1947

FIELD NOTES

NOTES FROM ARKANSAS

DDT SPRAYING PROGRAM IN ARKANSAS. On the residual spray program in Arkansas, they are doing a good job on "selling" the program locally, according to recent field reports. The householders are paying $3.25 per house; local participation is up to 50% by now and they expect to have at least 75% acceptance on the program by the end of the season.

This year 180 malaria cases have been reported to the Arkansas State Board of Health by local county health units.

PERCENTAGE OF HOUSES REFUSING SPRAYING REMAINS ABOUT THE SAME IN ARKANSAS. Over 28,000 houses were sprayed in May. This was more than in any other four-week period since spraying began, bringing the total number sprayed through May 31 to 65,739. This represents 70.3 percent of the total number of houses contacted, indicating that the number of houses refusing has increased only slightly, since the percentage of houses contacted through May 3 which agreed to take the house spraying service was 72.6.

NORTH CAROLINA NEWS

In Durham, N. C., 37 city blocks have been rat-proofed in the Rat-proofing Project. This includes 320 buildings and 528 establishments.

CDC is in receipt of a proposal from the State Health Officer of North Carolina for a program for utilization of DDT by food and drink establishments and dairy barns in an effort to control flies as well as mosquitoes.

NEW YORK MEETING

The New York State Health Department requested that representatives of the CDC Training Division attend a meeting in Troy, N. Y., on May 12, to discuss a program for field training in the state.

DISTRICT ACTIVITIES

DISTRICT 1 ACTIVITIES. S. A. Engr. (R) Sheldon L. Lang, of Dist. 1 attended the 34th Annual meeting of the New Jersey Mosquito Extermination Association, and presented a paper on CDC impounded water activities. Several CDC films were also shown at the meeting, and an exhibit was prepared showing various phases of malaria control.

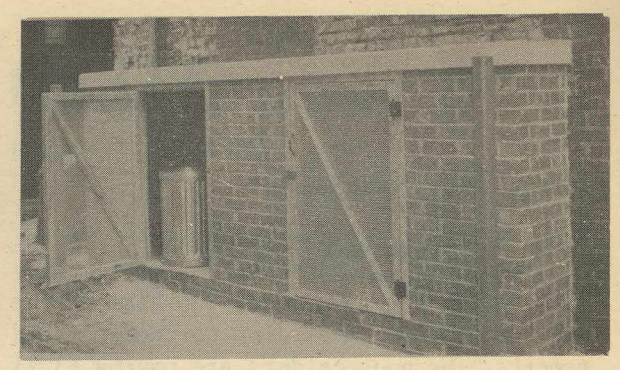
All CDC personnel in District 1 were vaccinated against smallpox on April 11.

A school for insect and rodent control workers was held by the First Army at Fort Dix, N. J., April 30 through May 2. District 1 CDC personnel participated by giving lectures, assisting in field demonstrations, and supplying films and film strips.

SCHOOL ON INSECT AND RODENT CONTROL IN DISTRICT 2. Insect and Rodent Control Specialist J. E. Borches, of District No. 2, attended the Insect and Rodent Control School for Health Officers and Sanitarians at the University of Maryland on June 9, 10, and 11. Approximately 70 persons were in attendance at the school, including health officers or Sanitarians from 20 Maryland counties; representatives from the State Health Department, and from the Health Department of the City of Baltimore; and representatives from private industry, including two pest control operators. The University also had representatives present.

A great deal of interest was aroused in insect and rodent control, and it appears that there is a possibility of establishing a section for such activities in the State Health Department, according to Mr. Borches' report.

DDT POWER SPRAYING IN MISSISSIPPI. In Mississippi, demonstrations of a DDT power spray unit for the control of flies were carried on in June. CDC personnel participated in reconnaissance activities to locate sections of fly prevalence, and also assist-



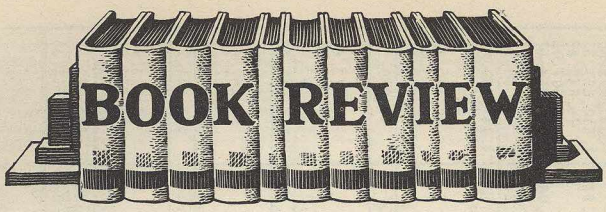
Proper care and disposal of refuse is necessary in the control of disease-bearing insects and rodents. These pictures illustrate poor (left) and excellent (right) garbage handling.

ed in the preparation of an operations map and spray schedule.

The city dump and a large livestock barn at Hattiesburg were then sprayed. Grill checking stations showed heavy fly infestation in each area before spraying. Post spray inspections indicated approximately 85% decrease in fly population from the highest station on the dump, and approximately 98% reduction at the highest station in the barn.

DISTRICT 8 ACTIVITIES. S. A. Sanitarian (R) Fred C. Harmston of District 8 in May assisted National Forest Rangers in a survey of garbage and refuse storage, collection, and disposal at the Logan Canyon Recreational Area near Logan, Utah. The survey was in connection with rodent and insect investigations in the vicinity. Logan Canyon is a favorite recreational area for the people of Northern Utah, and about 300,000 persons visited there during the last season. The investigation revealed that the present system of handling garbage and refuse in the recreational area provides little opportunity for the breeding or maintenance of a rat population.

Other investigations in the District in which CDC personnel participated included Rodent and Insect Control Activities at the Regional Office of the Veterans' Administration, in Salt Lake City, Utah; Malaria Hazard, Rodent and Insect Control Activities at VA Hospital, Salt Lake City; Mosquito Control Activities at Logan, Cache County, Utah.



THE MILK INDUSTRY. By Roland W. Bartlett, PhD. New York: Roland Press, 1946. pp. 288 illustrated. Price $4.50.

This book is concerned chiefly with a discussion of the economics of the various phases of the milk industry and how application of the principles of economics affect the industry. The first part, titled " Freedom of Enterprise and Full Employment " deals with economic factors which have confronted the industry in the past and those which still confront it. The second part, " Efficiency and Per Capita Sales of Milk " presents an analysis of factors influencing the sale of milk and standards which may be used in measuring the efficiency of milk plants.

BASED ON 20 YEARS EXPERIENCE. The author's observations are based on twenty years' experience in studying the marketing of dairy products, and an independent nation-wide survey of the dairy industry during the past two years.

He points out that during the war there was a great increase in the production of milk and that now the industry is interested primarily in expanding markets. Consequently, he first centers his attention upon analyzing the concentration of control in the manufacture and sale of each important dairy product, and gives suggested remedies to eliminate high costs and harmful restrictions.

PRICE DROP PREDICTED. The author predicts a drop in prices in the next two to four years, with much unemployment in this country. The dairy industry must be able to operate on a low margin of profit in order to increase consumption. The best method of doing this, says Mr. Bartlett, is by the lowering of distribution costs and by encouragement of free competition, thus providing many new jobs at living wages. Another benefit of such a program, will be better nutrition through increased per capita consumption of milk, especially in the South.

STATISTICS INCLUDED. A mass of statistics is presented to show that the proportion of store sales to the total consumption tends to increase with an increase in store price differential, while a reduction or elimination of the differential tends to decrease the proportion of store sales with a corresponding decrease in per capita consumption. Prices can be lowered through more efficient operation. The effect of trade unions, government regulations, and trade monopolies on the milk business are discussed and recommendations made for eliminating the units of each.

A large section of Part II is devoted to an individual analysis of the studies of the milk industry in each of 28 cities showing some of the factors affecting the per capita sales of milk.

The author's earlier studies show that margins for receiving, processing, bottling, selling, and delivery of milk in Washington, D. C., are low compared with those of many other cities. The plant operations of four milk plants in Washington are given to show why these margins are low. The discussion deals primarily with technical plant efficiency, not cost accounting, though costs are included when on a comparable basis.

The need for sanitary regulations are recognized, but it is pointed out that more uniformity is desirable and careful reappraisal of milk ordinances must be made so that amendments may be enacted eliminating all unnecessary requirements which act as trade barriers.

SUMMARY. The book is an excellent detailed economic study and a specific plan of action, by which needed remedies in the dairy industry may be effected, resulting in improved nutrition, greater employment, and a better understanding of the problems by all groups within the industry.

Robert B. Carson,
S. A. Sanitarian (R)

Federal Security Agency — Communicable Disease Center, Fiscal Branch — U. S. Public Health Service

CUMULATIVE OBLIGATIONS INCURRED - BY OBJECT
AS OF APRIL 30, 1947

	01	02	03	04	05	07			08	09	
	PERSONAL SERVICES	TRAVEL & PER DIEM	TRANS. OF THINGS	COMMUNI-CATION SERVICES	RENT & UTILITY SERVICES	OTHER CONTRACTUAL SERVICES: REPAIRS	STOR. & CARE OF VEHICLES	MISC.	SUPPLIES & MATERIAL	EQUIPMENT	TOTAL
7570343.001 - C. C. D.											
Control of Malaria											
A - 1013 - C. S. Sal.	2,818,741.28										2,818,741.28
A - 1014 - Res. Off. Sal.	341,095.60										341,095.60
A - 1015 - Misc.		1,327.77	116,884.99	14,813.98	73,281.85	57,996.02	3,684.23	55,872.94	1,040,408.04	154,581.53	1,518,851.35
A - 1018 - C. S. Sal. (P.R.)	96,842.69										96,842.69
A - 1019 - Res. Off. Sal. (P.R.)	15,607.08										15,607.08
A - 1020 - Misc. (P.R.)			550.00	359.79	48.00	79.40		5,770.96	18,302.44	244.08	25,354.67
A - 1022(002)-Pur. of Automobiles										31,200.00	31,200.00
A - 1040 - Epid. Aid-Texas City, Tex.						6.10		34.59		6.25	46.94
Total	3,272,286.65	1,327.77	117,434.99	15,173.77	73,329.85	58,081.52	3,684.23	61,678.49	1,058,710.48	186,031.86	4,847,739.61
A. A. Control											
A - 1035 - C. S. Sal.	89,180.86										89,180.86
A - 1036 - Res. Off. Sal.	463.07										463.07
A - 1037 - Misc.			200.00	5.37	20.00	973.42	218.86	1,458.87	3,347.83		6,224.35
Total	89,643.93		200.00	5.37	20.00	973.42	218.86	1,458.87	3,347.83		95,868.28
Typhus Control											
A - 1024 - C. S. Sal.	596,373.68										596,373.68
A - 1025 - Res. Off. Sal.	39,483.30										39,483.30
A - 1026 - Misc.		312.33	13,507.33	298.41	443.41	14,851.90	512.59	4,334.59	100,376.93	5,686.27	140,323.76
Total	635,856.98	312.33	13,507.33	298.41	443.41	14,851.90	512.59	4,334.59	100,376.93	5,686.27	776,180.74
Polio Investigations											
A - 1073 - C. S. Sal.	62,267.45										62,267.45
A - 1074 - Res. Off. Sal.	3,227.50										3,227.50
A - 1075 - Misc.			693.57	270.04	594.75	451.99	120.00	1,910.81	35,877.78	30,227.34	70,146.28
Total	65,494.95		693.57	270.04	594.75	451.99	120.00	1,910.81	35,877.78	30,227.34	135,641.23
Diarrheal Disease Investigations											
A - 1030 - C. S. Sal.	65,813.80										65,813.80
A - 1031 - Res. Off. Sal.	10,356.34										10,356.34
A - 1032 - Misc.		143.91	1,118.22	599.75	42.13	1,196.56		396.05	32,416.41	3,098.35	39,011.38
Total	76,170.14	143.91	1,118.22	599.75	42.13	1,196.56		396.05	32,416.41	3,098.35	115,181.52
Total Appro. 7570343.001	4,139,452.65	1,784.01	132,954.11	16,347.34	74,430.14	75,555.39	4,535.68	69,778.81	1,230,729.43	225,043.82	5,970,611.38
7570342.002 - A. to S. Gen.											
Training (Intern.)											
A - 923 - C. S. Sal.	25,752.27										25,752.27
A - 924 - Res. Off. Sal.	11,337.10										11,337.10
A - 925 - Misc.	898.86	237.01	250.00	496.84		48.20		507.83	2,478.29	5,447.97	10,365.00
Total Appro. 7570342.002	37,988.23	237.01	250.00	496.84		48.20		507.83	2,478.29	5,447.97	47,454.37
7570340 - Cont. of T. B.											
A - 656 - Misc. Exp.			50.00						1,412.04	607.70	2,069.74
A - 657 - C. S. Sal.											
Total Appropriation 7570340			50.00						1,412.04	607.70	2,069.74
7570110(03) - Travel Exp. FSA											
A - 193 - Training		8,074.11									8,074.11
A - 195 - Malaria, etc.		94,029.22									94,029.22
A - 196 - Typhus		21,911.21									21,911.21
A - 199 - Mal. (P.R.)		1,216.54									1,216.54
Total Appro. 7570110(03)		125,231.08									125,231.08
Grand Total - All Appro.	4,177,440.88	127,252.10	133,254.11	16,844.18	74,430.14	75,603.59	4,535.68	70,286.64	1,234,619.76	231,099.49	6,145,366.57

Federal Security Agency — Communicable Disease Center, Fiscal Branch — U. S. Public Health Service

CUMULATIVE OBLIGATIONS INCURRED - BY OBJECT
AS OF MAY 31, 1947

	01	02	03	04	05	07			08	09	
	PERSONAL SERVICES	TRAVEL & PER DIEM	TRANS. OF THINGS	COMMUNI-CATION SERVICES	RENT & UTILITY SERVICES	OTHER CONTRACTUAL SERVICES			SUPPLIES & MATERIAL	EQUIPMENT	TOTAL
						REPAIRS	STOR. & CARE OF VEHICLES	MISC.			
7570343.001 - C. C. D.											
Control of Malaria											
A - 1013 - C. S Sal.	3,123,891.78										3,123,891.78
A - 1014 - Res. Off. Sal.	366,450.08										366,450.08
A - 1015 - Misc.		1,617.84	123,392.73	16,697.21	81,416.97	66,315.37	4,368.70	63,833.65	1,064,433.15	250,593.53	1,672,669.15
A - 1018 - C. S. Sal. (P.R.)	111,184.78										111,184.78
A - 1019 - Res.Off.Sal. (P.R.)	17,029.28										17,029.28
A - 1020 - Misc. (P.R.)			550.00	359.79	48.00	79.40		5,770.96	18,340.04	244.08	25,392.27
A - 1022(002)-Pur.of Automobiles										31,200.00	31,200.00
A - 1040 - Epid.Aid-Texas City,Tex.	6,472.27		100.00	2.89		40.97		487.50	16,494.43	2,533.90	26,131.96
Total	3,625,028.19	1,617.84	124,042.73	17,059.89	81,464.97	66,435.74	4,368.70	70,092.11	1,099,267.62	284,571.51	5,373,949.30
A. A. Control											
A - 1035 - C. S. Sal.	98,818.22										98,818.22
A - 1036 - Res. Off. Sal.	463.07										463.07
A - 1037 - Misc.			250.00	3.37	20.00	1,103.78	229.66	1,458.87	3,535.32		6,601.00
Total	99,281.29		250.00	3.37	20.00	1,103.78	229.66	1,458.87	3,535.32		105,882.29
Typhus Control											
A - 1024 - C. S. Sal.	658,742.95										658,742.95
A - 1025 - Res. Off. Sal.	43,117.02										43,117.02
A - 1026 - Misc.		452.28	14,996.13	326.46	482.65	16,832.35	511.39	4,574.54	103,764.44	10,298.29	152,238.53
Total	701,859.97	452.28	14,996.13	326.46	482.65	16,832.35	511.39	4,574.54	103,764.44	10,298.29	854,098.50
Polio Investigations											
A - 1073 - C. S. Sal.	71,588.74										71,588.74
A - 1074 - Res. Off. Sal.	3,616.50										3,616.50
A - 1075 - Misc.			743.57	282.36	758.94	562.82	120.00	1,953.04	38,189.87	48,381.88	90,992.48
Total	75,205.24		743.57	282.36	758.94	562.82	120.00	1,953.04	38,189.87	48,381.88	166,197.72
Diarrheal Disease Invest.											
A - 1030 - C. S. Sal.	73,961.82										73,961.82
A - 1031 - Res. Off. Sal.	11,055.74										11,055.74
A - 1032 - Misc.		143.91	1,318.22	672.46	60.78	1,401.66		396.05	32,976.20	9,403.87	46,373.15
Total	85,017.56	143.91	1,318.22	672.46	60.78	1,401.66		396.05	32,976.20	9,403.87	131,390.71
Total Appro. 7570343.001	4,586,392.25	2,214.03	141,350.65	18,344.54	82,787.34	86,336.35	5,229.75	78,474.61	1,277,733.45	352,655.55	6,631,518.52
7570342.002 - A. to S. Gen.											
Training (Intern.)											
A - 923 - C. S. Sal.	27,794.00										27,794.00
A - 924 - Res. Off. Sal.	12,606.47										12,606.47
A - 925 - Misc.		237.01	1,214.13	591.89		48.20	36.00	507.83	2,482.95	5,227.97	10,345.98
Total Appro. 7570342.002	40,400.47	237.01	1,214.13	591.89		48.20	36.00	507.83	2,482.95	5,227.97	50,746.45
7570340 - Cont. of T. B.											
A - 656 - Misc. Exp.			100.00						2,071.91	603.72	2,775.63
A - 657 - C. S. Sal.											
Total Appro. 7570340			100.00						2,071.91	603.72	2,775.63
7570110(03) - Travel Exp. FSA											
A - 193 - Training		9,028.51									9,028.51
A - 195 - Malaria, etc.		103,357.59									103,357.59
A - 196 - Typhus		24,873.75									24,873.75
A - 199 - Mal. (P.R.)		1,291.94									1,291.94
Total Appro. 7570110(03)		138,551.79									138,551.79
Grand Total - All Appro.	4,626,792.72	141,002.83	142,664.78	18,936.43	82,787.34	86,384.55	5,265.75	78,982.44	1,282,288.31	358,487.24	6,823,592.39

Federal Security Agency — Communicable Disease Center, Fiscal Branch — U. S. Public Health Service

CUMULATIVE OBLIGATIONS INCURRED - BY OBJECT
AS OF JUNE 30, 1947

	01	02	03	04	05	07			08	09	13	
	PERSONAL SERVICES	TRAVEL & PER DIEM	TRANS. OF THINGS	COMMUNI-CATION SERVICES	RENT & UTILITY SERVICES	OTHER CONTRACTUAL SERVICES			SUPPLIES & MATERIAL	EQUIPMENT	REFUNDS, AWARDS, ETC.	TOTAL
						REPAIRS	STOR. & CARE OF VEHICLES	MISC.				
7570343.001 - C. C. D.												
Control of Malaria												
A - 1013 - C. S. Sal.	3,351,308.16											3,351,308.16
A - 1014 - Res. Off. Sal.	394,343.90											394,343.90
A - 1015 - Misc.		2,022.86	151,756.52	19,488.22	92,556.50	179,535.09	4,725.57	68,614.25	1,260,911.12	348,511.66 *	373.85	2,028,495.64
A - 1018 - C. S. Sal. (P.R.)	125,798.02											125,798.02
A - 1019 - Res.Off.Sal. (P.R.)	18,392.81											18,392.81
A - 1020 - Misc. (P.R.)		340.00	1,450.00	389.46	48.00	148.15		6,856.21	21,682.51	278.38		31,192.71
A - 1022(002)-Pur. of Automobiles										31,200.00		31,200.00
A - 1040 - Epid.Aid-Texas City, Tex.			700.00	6.85		130.00		554.00	32,324.76	5,073.62		38,789.23
A - 1076 - Per.Ser.Epid.Aid-Tex.City	7,268.80											7,268.80
Total	3,897,111.69	2,362.86	153,906.52	19,884.53	92,604.50	79,813.24	4,725.57	76,024.46	1,314,918.39	385,063.66	373.85	6,026,789.27
A. A. Control												
A - 1035 - C. S. Sal.	99,764.09											99,764.09
A - 1036 - Res. Off. Sal.	496.40											496.40
A - 1037 - Misc.			300.00	3.37	20.00	1,144.84	226.00	1,458.87	3,942.78			7,095.86
Total	100,260.49		300.00	3.37	20.00	1,144.84	226.00	1,458.87	3,942.78			107,356.35
Typhus Control												
A - 1024 - C. S. Sal.	695,311.77											695,311.77
A - 1025 - Res. Off. Sal.	45,687.92											45,687.92
A - 1026 - Misc.		502.28	15,817.14	342.47	537.78	19,999.40	518.77	4,313.87	118,955.60	13,227.40 *		174,214.71
Total	740,999.69	502.28	15,817.14	342.47	537.78	19,999.40	518.77	4,313.87	118,955.60	13,227.40 *		915,214.40
Polio Investigations												
A - 1073 - C. S. Sal.	78,544.29											78,544.29
A - 1074 - Res. Off. Sal.	4,326.00											4,326.00
A - 1075 - Misc.			1,549.03	332.02	833.90	854.58	120.00	2,138.39	58,627.93	52,535.60		116,991.45
Total	82,870.29		1,549.03	332.02	833.90	854.58	120.00	2,138.39	58,627.93	52,535.60		199,861.74
Diarrheal Disease Invest.												
A - 1030 - C. S. Sal.	79,754.57											79,754.57
A - 1031 - Res. Off. Sal.	11,450.94											11,450.94
A - 1032 - Misc.		143.91	2,168.95	730.95	71.48	1,743.83		452.35	33,550.66	12,238.58 *		51,099.98
Total	91,205.51	143.91	2,168.22	730.95	71.48	1,743.83		452.35	33,550.66	12,238.58		142,305.49
Total Appro. 7570343.001	4,912,447.67	3,009.05	173,740.91	21,293.34	94,067.66	103,555.89	5,590.34	84,387.94	1,529,995.36	463,065.24	373.85	7,391,527.25
7570342.002 - A. to S. Gen.												
Training (Intern.)												
A - 923 - C. S. Sal.	28,085.65											28,085.65
A - 924 - Res.Off.Sal.	13,866.74											13,866.74
A - 925 - Misc.		237.01	1,228.70	645.39		48.20	36.00	507.83	2,482.95	5,227.97		10,414.05
Total Appro. 7570342.002	41,952.39	237.01	1,228.70	645.39		48.20	36.00	507.83	2,482.95	5,227.97		52,366.44
7570340 - Cont. of T. B.												
A - 656 - Misc. Exp.			150.00						4,700.69	1,226.93		6,077.62
A - 657 - C. S. Sal.	200.00											200.00
Total Appro. 7570340	200.00		150.00						4,700.69	1,226.93		6,277.62
7570110(03) - Travel Exp. FSA												
A - 193 - Training		10,090.21										10,090.21
A - 195 - Malaria, etc.		107,657.40										107,657.40
A - 196 - Typhus		27,074.24										27,074.24
A - 199 - Mal. (P.R.)		1,462.74										1,462.74
Total Appro. 7570110(03)		146,284.59										146,284.59
Grand Total - All Appro.	4,954,600.06	149,530.65	175,119.61	21,938.73	94,067.66	103,604.09	5,626.34	84,895.77	1,537,179.00	469,520.14	373.85	7,596,455.90

* Unrealized credits to obligations on sales of used trucks, (P. L. No. 600) $35,350.00: A - 1015 - $31,150.00; A - 1026 - $1,750.00; A - 1032 - $2,450.00, not included.

PERSONAL SERVICES EXPENDITURES FOR CDC ACTIVITIES

April 1947

ALLOCATION UNIT AND SYMBOL		COMMISSIONED PERSONNEL	PROF. & SCIENTIFIC	SUB-PROFESSIONAL	C. A. F.	CUSTODIAL	TEMPORARY	TOTAL
Alabama	01	$ 1,074.00	$ 270.96	$ 4,332.42	$ 668.18	$ 2,469.80	$ 13,525.17	$ 22,340.53
Arkansas	03	1,124.70	2,262.42	8,770.04	5,873.31	2,113.27	---	20,152.74
California	04	---	217.90	435.80	650.82	---	870.78	2,175.30
Florida	09	763.03	1,644.20	4,678.05	1,598.46	507.72	5,758.30	14,949.76
Georgia	10	1,921.75	2,099.32	6,402.99	1,818.07	379.88	16,988.57	29,610.58
Kentucky	16	373.50	609.46	393.28	189.94	---	1,001.83	2,568.01
Louisiana	17	1,139.75	2,474.05	2,283.31	1,865.64	931.28	5,924.10	14,618.13
Mississippi	23	1,459.00	333.66	2,368.14	1,067.34	213.08	30,744.31	36,185.53
Missouri	24	---	319.20	677.84	1,271.64	543.75	4,744.53	7,556.96
North Carolina	32	373.50	1,120.70	1,181.18	804.08	251.66	2,196.37	5,927.49
Oklahoma	35	456.75	841.82	705.28	877.42	---	1,167.37	4,048.64
South Carolina	39	327.00	2,147.52	7,440.68	1,774.65	976.70	1,884.17	14,550.72
Tennessee	41	---	1,305.70	2,189.60	842.70	517.70	2,588.79	7,444.49
Texas	42	2,301.25	3,946.08	10,024.42	2,447.00	496.36	11,366.47	30,581.58
Virginia	45	---	415.66	264.82	181.12	384.60	302.41	1,548.61
Other States & Div.	76	1,952.25	667.32	---	433.88	---	203.44	3,256.89
Puerto Rico	50	1,411.70	338.70	1,634.07	1,454.39	3,864.10	4,925.24	13,628.20
Laboratories, Training and Other Direct activities Conducted by CDC Headquarters (including Administrative and Executive Costs)		20,841.54	8,055.16	9,433.22	41,938.19	5,512.36	39,634.02	125,414.49
Total		$35,519.72	$29,069.83	$63,224.14	$65,756.83	$19,162.26	$143,825.87	$356,558.65

NOTE: Includes regular payrolls for periods ended in April and supplemental or final payrolls processed under 1947 Fiscal Year Appropriations during April, 1947.

PERSONAL SERVICES EXPENDITURES FOR CDC ACTIVITIES

May 1947

ALLOCATION UNIT AND SYMBOL		COMMISSIONED PERSONNEL	PROF. & SCIENTIFIC	SUB-PROFESSIONAL	C. A. F.	CUSTODIAL	TEMPORARY	TOTAL
Alabama	01	$ 1,078.20	$ 270.96	$ 2,961.09	$ 668.18	$ 3,446.06	$ 13,764.38	$ 22,188.87
Arkansas	03	1,120.50	2,262.42	10,372.37	4,291.43	2,049.54	---	20,096.26
California	04	---	---	668.16	650.82	---	870.78	2,189.76
Florida	09	749.80	1,644.20	3,932.15	1,537.40	378.47	4,901.64	13,143.66
Georgia	10	1,554.55	2,108.96	6,035.06	1,852.57	382.77	17,512.14	29,446.05
Kentucky	16	374.90	619.10	166.78	192.83	---	975.73	2,329.34
Louisiana	17	66.85cr	667.32	1,407.41	3,706.11	936.36	6,212.10	12,862.45
Mississippi	23	1,464.60	507.72	3,552.21	1,833.90	319.62	24,741.40	32,419.45
Missouri	24	---	619.10	1,210.54	1,405.29	483.51	7,354.52	11,072.96
North Carolina	32	374.90	1,120.70	1,190.82	804.08	251.66	2,534.92	6,277.08
Oklahoma	35	458.85	---	1,682.77	1,316.13	---	1,359.06	4,816.81
South Carolina	39	328.40	5,686.94	8,142.19	2,033.14	1,467.94	3,422.46	21,081.07
Tennessee	41	---	1,034.74	2,672.78	759.31	517.70	4,658.26	9,642.79
Texas	42	2,735.05	1,942.36	17,616.17	4,412.98	959.45	25,031.75	52,697.76
Virginia	45	---	623.49	685.01	319.62	1,049.08	2,052.96	4,730.16
Other States & Div.	76	2,636.94	462.29	---	356.70	---	427.22	3,883.15
Puerto Rico	50	1,264.60	338.70	1,972.14	1,819.44	4,232.16	6,137.25	15,764.29
Laboratories, Training and Other Direct Activities Conducted by CDC Headquarters (including Administrative and Executive Costs)		21,022.57	10,883.63	12,871.31	60,594.10	7,009.59	56,427.04	168,808.24
Total		$35,097.01	$30,792.63	$77,138.96	$88,554.03	$23,483.91	$178,383.61	$433,450.15

NOTE: Includes regular payrolls for periods ended in May and supplemental or final payrolls processed under 1947 Fiscal Year Appropriations during May, 1947.