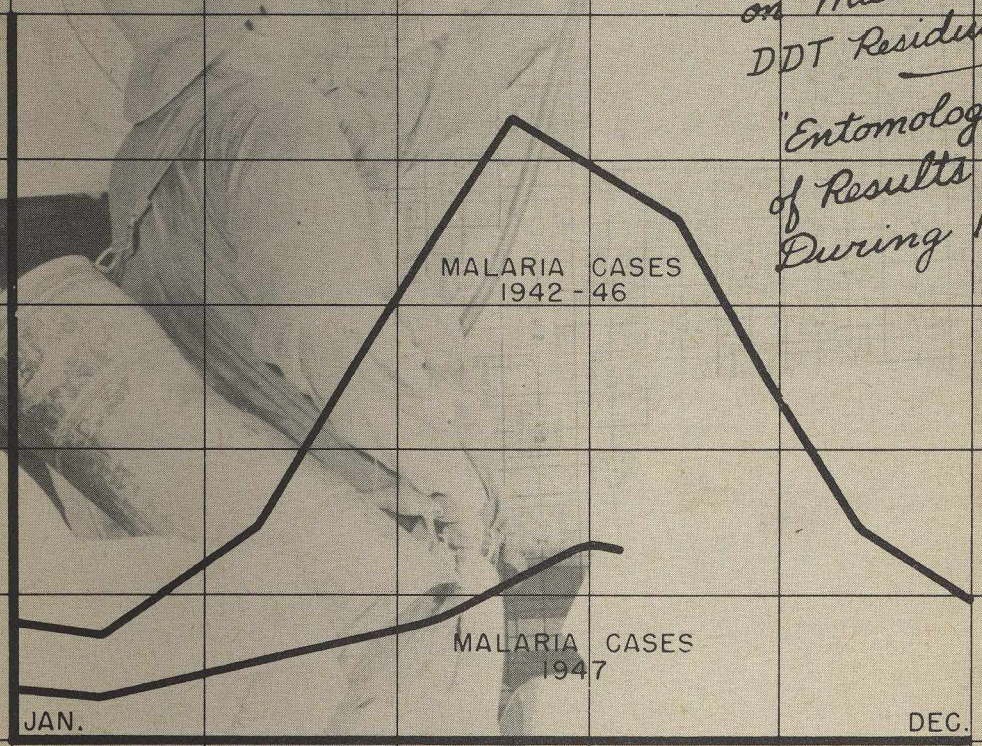
CDC Bulletin

JULY - AUGUST - SEPTEMBER - 1947

In this issue:

"A Preliminary Report on Malaria Control by DDT Residual Spraying"

"Entomological Evaluations of Results of DDT Spraying During 1946"



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

CDC BULLETIN

JULY . AUGUST . SEPTEMBER 1947

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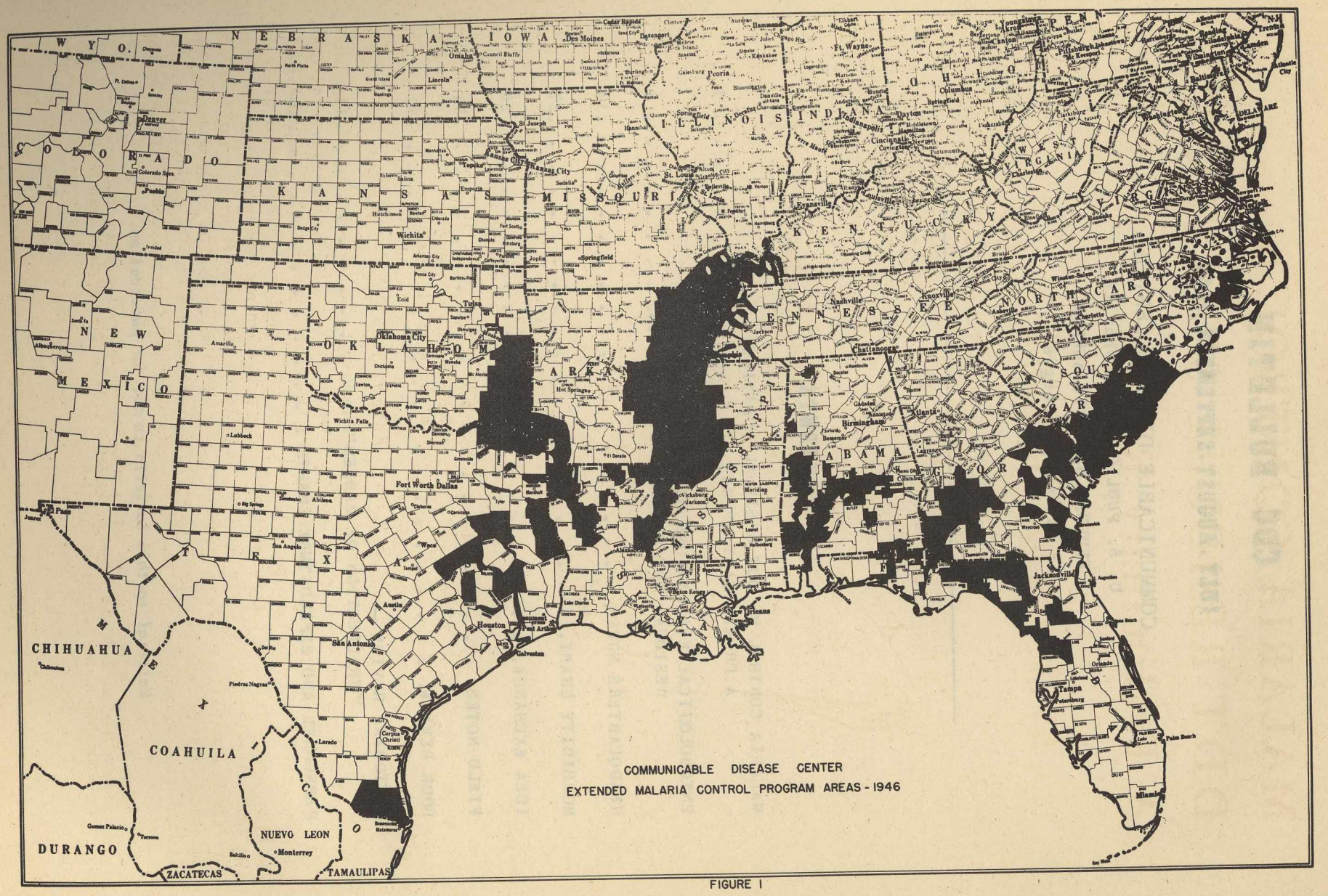
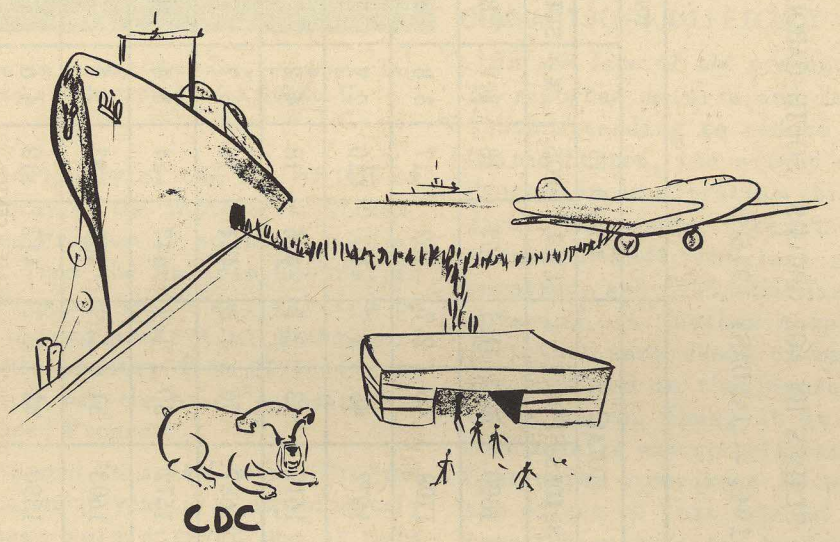


FIGURE 1

MALARIA CONTROL by DDT RESIDUAL SPRAYING*

A Preliminary Report

by Vernon B. Link



INTRODUCTION

It is estimated that over a half million of our troops acquired malaria during the years of World War II, of which number a certain unknown fraction returned to the United States as carriers, thus increasing our malaria potential to that extent. This potential threatened to reverse the consistent downward trend of malaria cases reported in this country over a period of years. It is too early to be certain whether or not the introduction of large numbers of carriers has actually increased malaria transmission in this country. However, no significant transmission has yet occurred which could be traced to importation of malaria from abroad. The downward trend of reported cases acquired within the United States is still being maintained.

EXTENDED CONTROL PROGRAM

To combat the possibility of transmission of malaria from returning servicemen to the civilian population, especially in the traditionally endemic malaria areas in the South, an emergency program directed against adult mosquitoes was initiated by the U. S. Public Health Service during the 1945 malaria season. The activity is called the Extended Malaria Control Program and

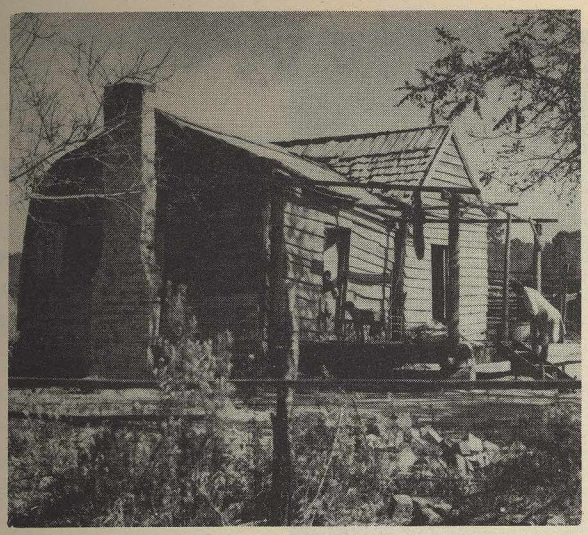
*This article is based on Dr. Link's presentation before the National Malaria Society Meeting in Miami, Florida, November 1, 1946. The complete article will be published in the Journal of the NMS.

Table I

PERCENT POSITIVE BLOOD SLIDES BY AGE GROUPS, SOUTH CAROLINA,

JUNE 1945 — JANUARY 1946

MONTH OF SURVEY	SPRAYED AREA									UNSPRAYED AREA								
	UNDER 10			OVER 10			TOTAL			UNDER 10			OVER 10			TOTAL		
	SLIDES	POS.	%	SLIDES	POS.	%	SLIDES	POS.	%	SLIDES	POS.	%	SLIDES	POS.	%	SLIDES	POS.	%
June	580	33	5.7	1110	36	3.2	1690	69	4.1	462	18	3.9	883	41	4.6	1345	59	4.4
July	592	27	4.6	1116	19	1.7	1708	46	2.7	452	17	3.8	835	10	1.2	1287	27	2.1
August	593	28	4.7	1079	17	1.6	1672	45	2.7	460	10	2.2	808	10	1.2	1268	20	1.6
September	564	28	5.0	1055	15	1.4	1619	43	2.7	426	18	4.2	752	21	2.8	1178	39	3.3
October	573	18	3.1	1064	12	1.1	1637	30	1.8	434	16	3.7	798	22	2.8	1232	38	3.1
November	570	15	2.6	1002	15	1.5	1572	30	1.9	447	24	5.4	815	28	3.4	1262	52	4.1
December	576	15	2.6	1027	16	1.6	1603	31	1.9	435	23	5.3	795	23	2.9	1230	46	3.7
January	589	32	5.4	1001	11	1.1	1590	43	2.7	417	19	4.6	767	18	2.3	1184	37	3.1



Typical house in Santee-Cooper area where one of the malaria study projects is located.

consists principally of the use of DDT as a residual spray on the interior of houses. This Extended Program is so named to distinguish it from the Malaria Control in War Areas Program which was carried on during the war to protect MILITARY personnel in this country from CIVILIAN malaria and which was the exact opposite aim of the Extended Program.

In the Extended Malaria Control Program during the calendar year 1945 approximately 400,000 houses were sprayed one or more times in 119 counties of 13 states, and expanded so that approximately 750,000 houses were sprayed one or more times in 266 counties of 13 states during 1946. Figure 1 shows a map of all areas of operations in 1946.

EXTENDED PROGRAM NOT NEW IDEA

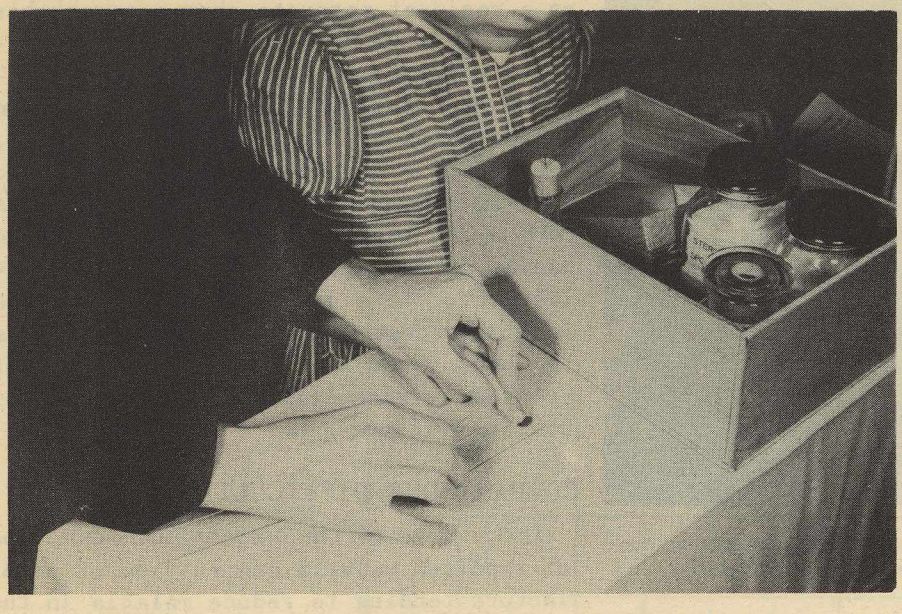
The Extended Program is based on results of laboratory work which demonstrated the residual effect of DDT and its lethal action against adult mosquitoes. Reduction of malaria by controlling adult anophelines is not a new idea. Orenstein (1), in Panama, reduced human malaria by employing laborers to catch adult mosquitoes daily. Russel, Knipe, and Sitapathy (2), in India, reduced human malaria by using pyrethrum sprays to keep interiors of houses free of mosquitoes. Aitken (3), in Italy, used DDT as a residual spray to show a remarkable effect in reducing larval densities, mosquito populations, enlarged spleen frequencies, size of spleens, and positive parasite rates. Trapido (4), in Panama, used DDT as a residual spray to demonstrate a large reduction in numbers of mosquitoes both in the village area outside of treated houses as well as in the forest area adjacent to the village. He also showed a definite reduction of positive blood smears in the sprayed village, a reduction not previously accomplished by ten years of therapeutic methods.

COMPARISONS DIFFICULT

In the face of the present downward trend of reported malaria and in view of other factors tending to reduce malaria in the United States, the effect of the Extended Program in accelerating this trend is difficult to measure. Comparison of cases reported in 1944, the last year before DDT spraying, and 1945, the first year of DDT spraying, is further complicated by the fact that many cases of military malaria are included in the figures reported for those years. Thus, it is not known how much malaria was actually acquired locally. Continuing experience is necessary before the effect of this type of program in decreasing malaria can be measured in terms of reported cases. However, the effect on the incidence of cases of human malaria in areas which have been sprayed with DDT has been measured in the two study projects which were established in the fall of 1944 by the Office of Malaria Control in War Areas and have been continued by the Communicable Disease Center.

SANTEE-COOPER PROJECT

The first of these study projects was located at the Santee-Cooper Reservoir in South Carolina and is a cooperative study with the South Carolina State Board of Health. This region was chosen because it represented the only known high endemic malaria area in the United States. Nearly 20% of the population showed positive blood films in October 1944. A portion of the area adjacent to the reservoir was divided



Thick blood smears were made from all persons in the malaria control survey area.

into approximately equal parts, one of which was sprayed, the other left unsprayed. Each part has a population of approximately 1,500 people, of whom 90% are Negroes. Most of the people work on farms and live in homes which are not mosquito-proofed. A preponderance of the malaria in the area is caused by *Plasmodium falciparum*. *Anopheles quadrimaculatus* is the important mosquito vector in this area.

Houses were sprayed with DDT during the last two weeks of April 1945, and again during the last two weeks of July 1945.

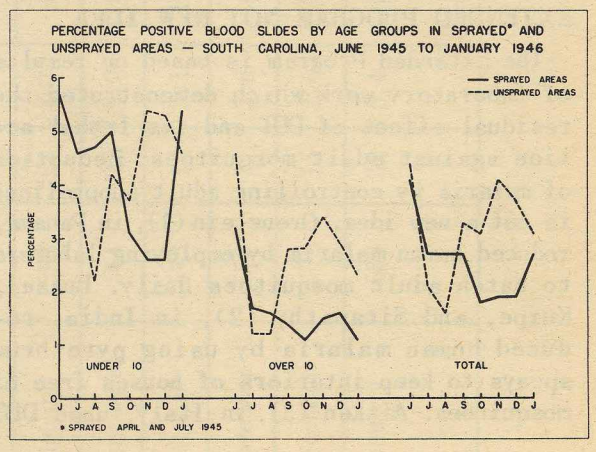
BLOOD SMEAR SURVEYS MADE

The criterion used to measure the amount of malaria present is the thick blood film. Pre-spraying blood surveys were conducted in October 1944 and in April 1945. Post-spraying surveys were carried out at monthly intervals beginning in June 1945, and are still continuing. Figure 2 and table 1 summarize the results of the blood surveys. Unfortunately, even though there were high percentages of positive smears in both areas when the study was begun, there was a rapid fall in these percentages in both the sprayed and the unsprayed areas. However, the rate in the sprayed area decreased after spraying to a rate which was significantly lower than in the unsprayed area during the 1945 malaria transmission season. (5)

PROJECT ESTABLISHED IN PUERTO RICO

The second project established for the purpose of determining what effect DDT has on human malaria was located in Puerto Rico. This is a joint project of the School of Tropical Medicine, Insular Health Department, and the U. S. Public Health Service District No. 6. Epidemiological, entomological, and engineering assistance in starting the study was supplied by the Office of Malaria Control in War Areas. This study is of especial interest because of the fact that the important malaria vector in Puerto Rico is *Anopheles albimanus*, a "wild" mosquito whose habits differ from those of the vector found in the

FIGURE 2



United States as it seldom remains within houses except for a few hours during the night.

Two villages, Humacao Playa and Loisa Aldea, situated in the northeast corner of Puerto Rico, were selected for the study. Humacao Playa was chosen as the sprayed village and Loisa Aldea was left unsprayed. These villages are similar enough in all of the factors involved in malaria transmission to be acceptable as comparable areas. Spraying was accomplished in November 1944, June 1945, and November 1945, and consisted of premise spraying of houses and outbuildings.

FIGURE 3

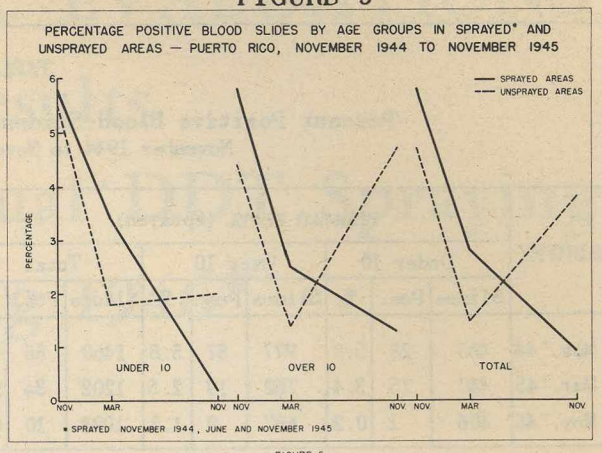


FIGURE 5

TRAP COLLECTIONS

Animal bait trap and light trap collections which were made throughout the year showed that *albimanus* was present in sufficient numbers during the study period to transmit malaria. From one to several hundred *albimanus* were collected from all traps during each night of operation.

RESULTS OF BLOOD FILM SURVEYS

Three blood film surveys were made in the late fall of 1944, in early spring of 1945, and the late fall of 1945. The results of these surveys are shown in summary on figure 3 and table 2. It will be noted that both villages show a decrease in positive smears in the second survey which represents the normal seasonal decline in the incidence of malaria transmission. On the third survey, however, a very significant difference in positive blood smears is seen in which the sprayed village showed only 0.9% positive smears while the unsprayed village showed 3.8% positive smears. The 0-9 year age group in the sprayed village shows the greatest decrease of all in the third survey. Since positivity in younger age groups is often used as an index of transmission, it is considered to be especially significant

Typical street in Humacao Playa, Puerto Rican village selected for DDT spraying studies. CDC spray crew and equipment truck at right.

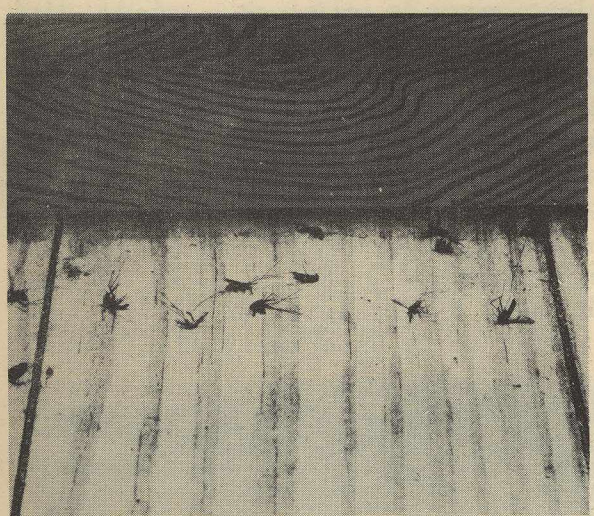
Native crew workers in Puerto Rico are shown the intricacies of spray equipment.

TABLE 2

Percent Positive Blood Slides by Age Groups, Puerto Rico
November 1944 to November 1945 *

SURVEY	HUMACAO PLAYA (Sprayed)									LOIZA ALDEA (Unsprayed)								
	Under 10			Over 10			Total			Under 10			Over 10			Total		
	Slides	Pos.	%	Slides	Pos.	%	Slides	Pos.	%	Slides	Pos.	%	Slides	Pos.	%	Slides	Pos.	%
Nov.'44	483	28	5.8	977	57	5.8	1460	85	5.8	380	21	5.5	891	39	4.4	1271	60	4.7
Mar.'45	440	15	3.4	762	19	2.5	1202	34	2.8	276	5	1.8	576	8	1.4	852	13	1.5
Nov.'45	406	1	0.2	687	9	1.3	1093	10	0.9	292	6	2.0	576	27	4.7	868	33	3.8

that so few positives were recorded in this group in comparison with the number of positives in the same age group of the unsprayed village. (6)



Mosquitoes die soon after contacting walls and other surfaces sprayed with DDT.

ACKNOWLEDGEMENT

Acknowledgement is due to Surgeon (R) R. F. Reider, Medical Officer in Charge, Malaria Investigations Project, Manning South Carolina, for providing data used in figure 2 and table 1.

Similar acknowledgement is due to Sanitary Engineer (R) Porter A. Stephens, U. S. Public Health Service District No. 6, San Juan, Puerto Rico, for providing data used in figure 3 and table 2.

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(4) Trapido, Harold. 1946. The residual spraying of dwellings with DDT in the control of malaria transmission in Panama with special reference to *Anopheles albimanus*. Am. J. Tr. Med. 26:(4), pp 383-415.

(5) Reider, R. F., McDaniel, G. E., and Gilliam, A. G. Efficacy of DDT residual spray in preventing human malaria in an endemic area. (to be published).

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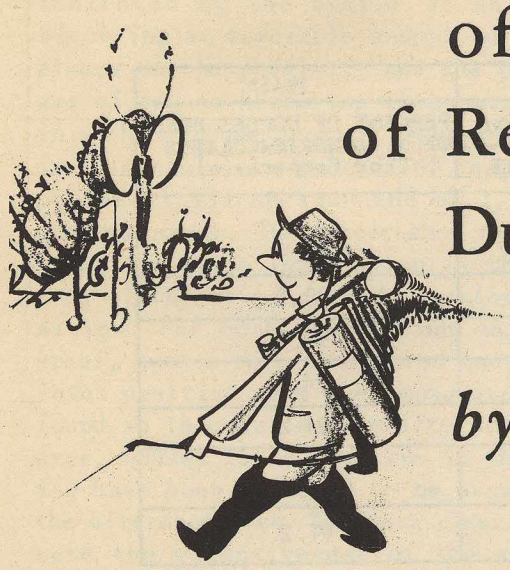
ENTOMOLOGICAL EVALUATIONS of Results of Residual DDT Spraying During 1946*



by G.H. Bradley and Roy F. Fritz

During the 1946 season the Communicable Disease Center of the U. S. Public Health Service, in cooperation with State Health Departments in the Southern States continued and expanded the Extended Program for malaria control which was begun during 1945. This program consists principally of the spraying of DDT in houses to control malaria in the more important endemic areas of the South, and to meet the threat of increased malaria transmission occasioned by the return of service personnel who contracted the disease overseas. During 1945 the houses and privies on some 40,000 premises were given one or more treatments with DDT emulsion applied at the rate of 100 mg. of DDT per square foot. Over 750,000 houses in 266 counties of 13 states were treated during the 1946 season with a similar number of residual applications of DDT. In 1946, however, the DDT application rate was doubled, that is, 200 mg. were applied per square foot in an effort to secure a longer lasting residual effect and thereby decrease the frequency of application.

The results of this work were measured by entomological criteria. These measurements were of two types:

1. A small percentage of houses selected at random in sprayed areas was inspected to determine the results of the spray in keeping houses free of resting *A. quadrimaculatus*. At the time of each house inspection, the number of *quadrimaculatus* in an adjacent favorable resting place also was determined to obtain a general index to mosquito abundance on the premises. Barns were used principally for the latter purpose. A number of similar house and outbuilding examinations also were made in unsprayed areas for comparison.

2. Precipitin tests were made of blood from engorged specimens of *quadrimaculatus* collected from sprayed and unsprayed areas in order to determine the effect of the spray in reducing the numbers of mosquitoes which feed on man and persist about premises. This method of evaluating results is based on the supposition that *quadrimaculatus* feeds on man principally while indoors. If the spray is having the desired effect in killing these human feeders, the *quadrimaculatus* population about sprayed premises should contain fewer human-fed specimens than is the case normally.

Table I summarizes the results of the

* In the preceding paper by Dr. Link, available data on the effect of the DDT residual spray in reducing malaria have been presented and discussed. It is the purpose of this paper to present some of the results of the work as measured by entomological criteria.

Table I

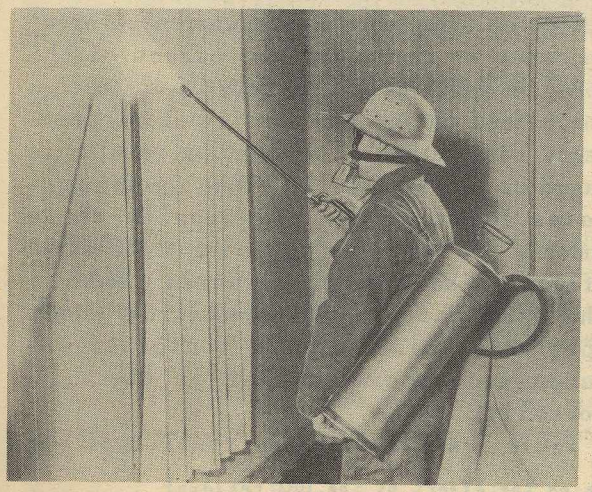
HOUSE INSPECTIONS ON RESIDUAL SPRAY PROGRAM. TOTAL TREATED HOUSES INSPECTED AND PERCENT FREE OF *A. QUADRIMACULATUS* IN AFTERNOON.

MONTHS AFTER SPRAYING	NUMBER HOUSES INSPECTED	1946		1945*
		HOUSES FREE OF *A. QUAD.*		PERCENT OF HOUSES FREE OF *A. QUADRIMACULATUS* (For Comparison)
		NUMBER	PERCENT	
1	6,018	5,969	99.19	98.9
1 - 2	6,739	6,673	99.02	98.3
2 - 3	5,321	5,271	99.06	95.7
3 - 4	2,974	2,935	98.22	94.7
4 -	899	883	98.22	94.2
TOTAL	21,951	21,731		
PERCENT			99.00	97.2

* Bradley, G.H., and Fritz, Roy F. 1946. Entomological evaluation of DDT residual spraying for malaria control. Journ. Nat'l Malaria Soc. 5:141-145.

1946 spraying operations in keeping houses free of resting anophelines. Of 6,018 houses inspected up to one month after spraying, only 49 or 0.81 percent contained anophelines; thus 99.19 percent of the treated houses were found to be free of these mosquitoes. At intervals of 1 to 2, 2 to 3, 3 to 4, and over 4 months, after spraying, the percentages of sprayed houses with mosquitoes increased slightly, but even after 4 months *A. quadrimaculatus* was found in only 1.78 percent of the sprayed houses. For comparison, the percentages of *quadrimaculatus*-positive houses at similar intervals after spraying during the 1945 season are shown in table I. As has been stated, an application of only 100 mg. DDT per square foot was used during 1945, while the 1946 application rate was 200 mg. per square foot. The effect of the heavier dosage in increasing the duration of spray effectiveness is clearly indicated by the smaller percentages of *quadrimaculatus*-positive houses occurring in each spray-age group during 1946. In all, 21,951 sprayed houses were inspected during 1946, of which only approximately 1 percent was found to contain mosquitoes. This compares with 2.8 percent of sprayed houses positive for mosquitoes in 1945 when the lighter DDT application was made.

Premise spraying inside homes and other buildings is the principal method used in the Extended Malaria Control Program.

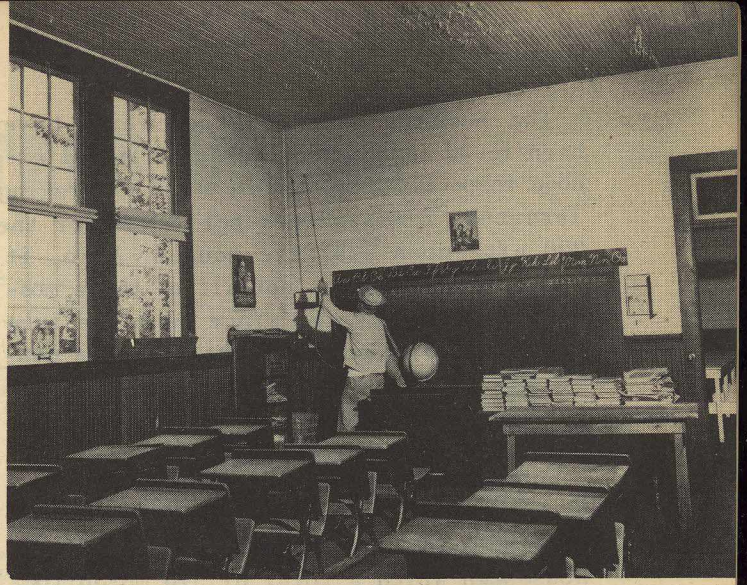


INSPECTION RECORDS

In table II the inspection records of both sprayed and unsprayed houses are

summarized and arranged to show the number of houses inspected on premises having various densities of *quadrimaculatus*, as indicated by the number of *Anopheles* occurring in favorable unsprayed resting places on the premises, and the percentage of houses harboring these mosquitoes in each of these density groups. Included in this table are records of inspections of the 21,951 sprayed and of 1,639 unsprayed houses. The latter show the extent of normal house infestation in the presence of the various *quadrimaculatus* densities. For both sprayed and unsprayed areas, houses were considered *quadrimaculatus* positive only when mosquitoes were found in them during the afternoon. However, houses found negative in the morning have been presumed to be negative in the afternoon also. The data clearly indicate the effectiveness of the spray in keeping premises free of resting mosquitoes. As might be expected, as the densities of mosquitoes about premises increase, the percentage of houses with mosquitoes also increases to a slight extent.

Selection of areas for residual spray operations has been based on malaria rates rather than on *quadrimaculatus* densities. However, it is of interest that of the 21,951 sprayed houses inspected, 6,995 or 32 percent were in areas having premise densities in the groups above 10, while of the 1,639 unsprayed houses inspected only 241 or 15 percent were in this category; thus, indicating that in those areas in which residual spray work has been carried on, that is, in the more malarious areas, *Anopheles* densities are in general higher than in areas not selected for the work.



Spraying walls of rural schools.

Table II

HOUSE INSPECTIONS ON RESIDUAL SPRAY PROGRAM

NUMBER OF HOUSE INSPECTIONS IN VARIOUS *QUADRIMACULATUS* DENSITY GROUPS IN SPRAYED AND UNSPRAYED AREAS AND PERCENT OF AFTERNOON *QUAD.*-POSITIVE HOUSES

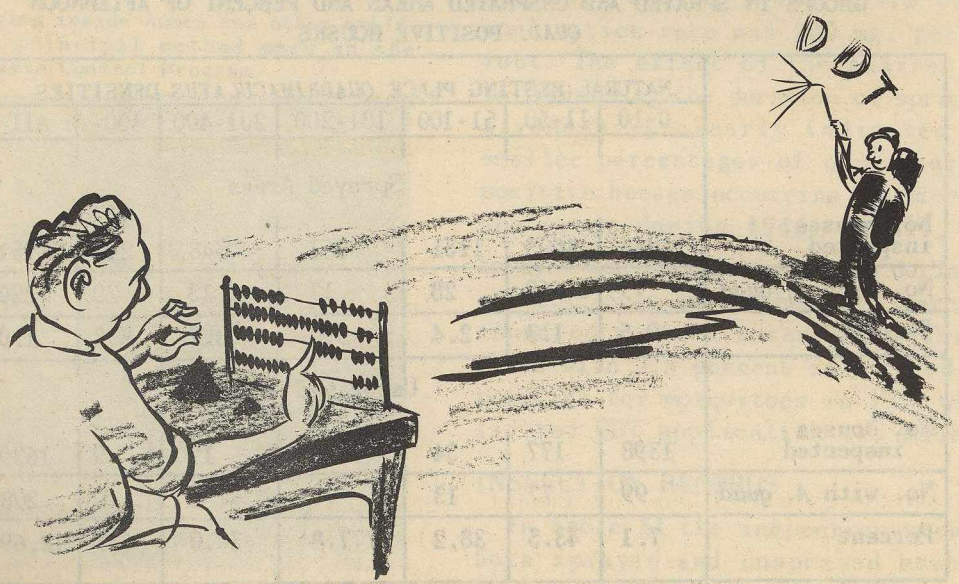
	NATURAL RESTING PLACE *QUADRIMACULATUS* DENSITIES						
	0-10	11-50	51-100	101-200	201-400	400-	All
	Sprayed Areas						
No. houses inspected	14956	4693	1151	561	348	242	21951
No. with *A. quad.*	79	63	28	17	13	20	220
Percent	0.5	1.3	2.4	3.0	3.7	8.3	1.0
	Unsprayed Areas						
No. houses inspected	1398	177	34	9	12	9	1639
No. with *A. quad.*	99	77	13	7	6	6	208
Percent	7.1	43.5	38.2	777.8	50.0	66.7	12.69

The numbers of mosquitoes which have been found in sprayed houses during afternoon inspections have been small, averaging less than 2 mosquitoes per house for the 220 afternoon positive houses. Also, it is quite likely that not all of these mosquitoes will survive since we may assume that some of them will shift from a nonlethal to a lethal surface during the evening providing the house has been properly sprayed.

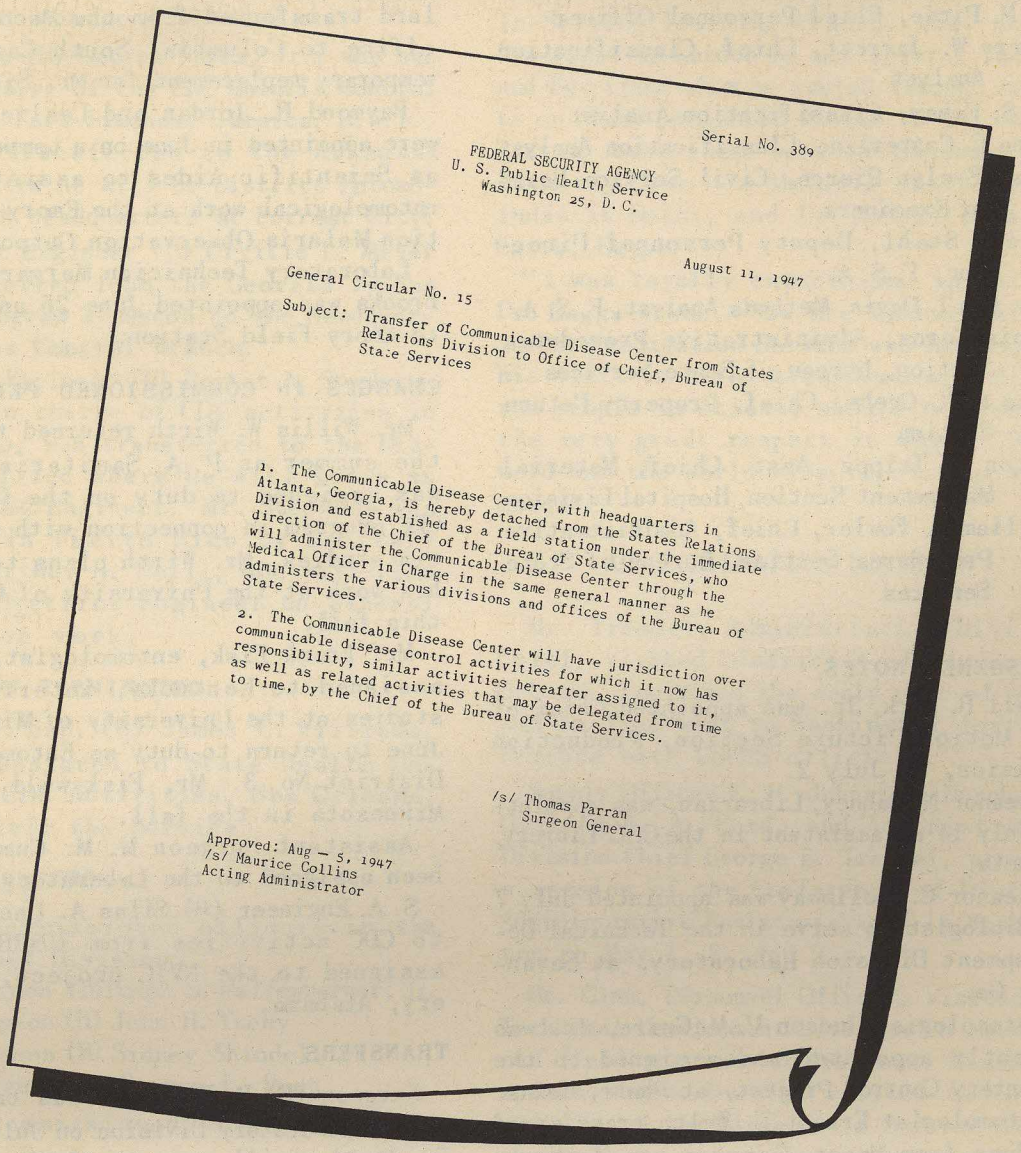
Concerning the reduction of *quadrimaculatus* positive houses from morning to afternoon, we have records of 175 sprayed houses in which a total of 318 mosquitoes were found during the morning. Upon reinspection during the afternoon, 124 of these houses were mosquito-free. Thus a reduction in positive houses from morning to afternoon of 71 percent occurred. In the remaining 51 houses in which mosquitoes survived until afternoon, a total of 97 mosquitoes was counted in the morning and 74 in the afternoon for a reduction of only 25 percent. No doubt the explanation for this persistence is that these houses were not adequately sprayed since it has been found that normally fewer mosquitoes are found inside houses in the afternoon than in the morning. The meager data we have on this point show such a reduction of about 13 percent.

Incomplete data on the results of the residual spray work in the selective killing of anophelines which have taken human blood meals as determined by precipitin tests show that of 25,798 specimens of *quadrimaculatus* collected on premises where the houses had been treated with DDT residual spray, only 40 or 0.2 percent had fed on humans, while of 6,509 specimens collected from premises where the houses were untreated, 74 or 1.1 percent had had human blood meals. This finding of 1.1 percent human feedings among the unsprayed premise specimens as against 0.2 percent among sprayed premise specimens is highly significant statistically. By chance, such a difference would be expected to occur in like samplings less than one time in 20 million.

These data indicate that the proportion of the *Anopheles* population containing human blood meals is 82 percent less around sprayed than around unsprayed premises. Of course, the effect of the spray work in lessening malaria can only be determined from epidemiological data. However, it may be concluded that the chance for malaria transmission in the sprayed areas has been greatly reduced as a result of this highly effective killing of human-fed *Anopheles*.



HEADQUARTERS NOTES



Serial No. 389

FEDERAL SECURITY AGENCY
U. S. Public Health Service
Washington 25, D. C.

August 11, 1947

General Circular No. 15

Subject: Transfer of Communicable Disease Center from States Relations Division to Office of Chief, Bureau of State Services

1. The Communicable Disease Center, with headquarters in Atlanta, Georgia, is hereby detached from the States Relations Division and established as a field station under the immediate direction of the Chief of the Bureau of State Services, who will administer the Communicable Disease Center through the Medical Officer in Charge in the same general manner as he administers the various divisions and offices of the Bureau of State Services.

2. The Communicable Disease Center will have jurisdiction over communicable disease control activities for which it now has responsibility, similar activities hereafter assigned to it, as well as related activities that may be delegated from time to time, by the Chief of the Bureau of State Services.

/s/ Thomas Parran
Surgeon General

Approved: Aug — 5, 1947
/s/ Maurice Collins
Acting Administrator

TEXAS CITY PROGRAM TO END. S. A. Sanitarian (R) Howard B. Hollander, who succeeded S. A. San. Engr. Donald J. Schliessman at Texas City, Texas, was relieved of duty there on July 15, closing the period of Public Health Service professional service in the area.

Funds have been allocated for fiscal year 1948 to liquidate the public health rehabilitation activities in Texas City, and will be used mostly for DDT spraying. Public Health participation will be completed on or before October 1, 1947.

WASHINGTON VISITORS. Sanitary Engineer Director Mark D. Hollis, Dr. J. W. Mountin, and Dr. Fred T. Foard, were in the headquarters office August 12 and 13 to go over with each division the current year's program and discuss the proposed program for the 1949 fiscal year. During the two days each division chief was requested to give a brief outline of future plans.

Among visitors to the Administrative Division during the quarter were the following from Washington:

R. M. Pirie, Chief Personnel Officer
Harry W. Jarrett, Chief, Classification Analyst
A. S. Fahey, Classification Analyst
Edna C. Casterline, Classification Analyst
Miss Evelyn Pierce, Civil Service Board of Examiners
Glenn Stahl, Deputy Personnel Director, F. S. A.
Mrs. Eva T. Davis, Methods Analyst, F. S. A.
Louis Doros, Administrative Procedures Section, Bureau of State Services
Miss O. K. Grebe, Chief, Property Return Section
Alton D. Trippe, Asst. Chief, Material Management Section, Hospital Division
William B. Fowler, Chief, Administrative Procedures Section, Bureau of State Services

PERSONNEL NOTES

Will R. Beck, Jr. was appointed Chief of the Motion Picture Section, Production Division, on July 2.

Eleanor N. Dabney, Librarian, was appointed July 14 as assistant in the CDC Library, Atlanta.

Eleanor C. Holloway was appointed July 7 as Biologist to serve in the Technical Development Division Laboratory, at Savannah, Ga.

Entomologist Judson U. McGuire, Jr. was recently appointed and assigned to the Dysentery Control Project, at Pharr, Texas.

Entomologist Ernest U. Welch transferred in June from Macon, Georgia, to Montgomery, Alabama.

William D. Dudio was appointed as Entomologist in the Headquarters Laboratory Division on July 1.

Bacteriologist Robert A. Patnode was appointed to the Headquarters Laboratory Division July 15.

Administrative Assistant Porter T. Stanford, Jr. has been assigned to Austin, Texas, for a period of training in field administrative duty.

Administrative Assistant Edward J. Sisselberger transferred from Columbia, South Carolina, to the District No. 2 Office, Richmond, Virginia.

Administrative Assistant James D. Gillard transferred from the Macon, Georgia office to Columbia, South Carolina, as temporary replacement for Mr. Sisselberger.

Raymond H. Jordan and Leslie L. Porter were appointed in June on a temporary basis as Scientific Aides to assist with the entomological work at the Emory Field Station Malaria Observation Outpost.

Laboratory Technician Margaret Middlebrooks was appointed June 26 and assigned to Emory Field Station.

CHANGES IN COMMISSIONED PERSONNEL

Mr. Willis W. Wirth returned to duty for the summer as P. A. Sanitarian (R) and was assigned to duty on the California CDC program in connection with encephalitis studies. Mr. Wirth plans to continue his work at the University of California this fall.

Mr. Frank Fisk, entomologist, formerly assigned to Kentucky, interrupted his studies at the University of Minnesota in June to return to duty as Entomologist in District No. 3. Mr. Fisk will return to Minnesota in the fall.

Assistant Surgeon M. M. Cummings has been assigned to the Laboratory Division.

S. A. Engineer (R) Silas A. Lacy returned to CDC activities from UNRRA and was assigned to the NVIC project, Montgomery, Alabama.

TRANSFERS

Surgeon (R) R. F. Reider was transferred to the Laboratory Division on July 1, 1947. Dr. Reider will serve as Assistant Chief of that division.

S. A. San. Engr. (R) James H. Crawford has been transferred from USPHS District No. 3, Chicago, to CDC Headquarters, Atlanta, Ga.

P. A. Engr. (R) James L. Church, Jr. has been transferred from Cambridge, Mass., to State Health Department, Nashville, Tenn.

S. A. San. (R) Leslie D. Beadle has been transferred from Denison, Texas, to CDC, Atlanta, Ga.

S. A. San. (R) George Thompson, who has been in the Caribbean area for the past

three years, has been transferred to the position of operations entomologist on the Neurotropic Virus Diseases-Insect Control Project at Montgomery, Alabama.

Asst. San (R) George Hayes, Jr., who has been in charge of the CDC Malaria Control Project at Fort Simonds, Jamaica, B.W.I., has been transferred to the Arkansas program where he will be District Entomologist with headquarters at Forrest City.

Assistant Engineer (R) Orville L. Meyer was transferred from the Georgia Typhus Control Program at Macon to the Headquarters Typhus Control Branch.

Sanitary Engineer (R) Porter A. Stephens, formerly in charge of CDC activities in Puerto Rico, was transferred to the District 4 office where he will serve as District CDC Engineer. Mr. Stephens was replaced in Puerto Rico by Sanitary Engineer Arthur H. Neill, who will also serve as District Engineer on general sanitation work.

COMMISSION TERMINATED

Jr. Asst. San. (R) James C. Williams, formerly assigned to State Health Department, CDC Activities, New Orleans, La., has left the Service.

NEW COMMISSIONS

Newly commissioned officers in the Epidemiology Division:

Asst. Surgeon (R) Ralph S. Paffenbarger, Jr.
Asst. Surgeon (R) John H. Tuohy
Asst. Surgeon (R) Sidney Shindell
Asst. Surgeon (R) George F. Reed

Newly commissioned officers in the Laboratory Division:

Sr. Asst. Scientist Libera Ajello
Asst. Surgeon (R) Robert Mattingly

DR. DAGGY WRITES FROM ARABIA

Dr. Richard H. Daggy paid a short visit to the Communicable Disease Center in May on his way to the Far East. Dr. Daggy was affiliated with MCWA in 1945, just after his release from a long tour of duty in the Navy. He left the organization in the fall of 1945 to resume teaching. Later he accepted a position with Arabian-American Oil Company, and was on his way to Arabia for that concern when he visited CDC Headquarters. When he reached his destination he wrote Mr. Dubuque, of the In-Service Training Branch, that during his visit to London he met several Indians and Egyptians whom he routed through Atlanta on their projected visits to the United States. Among these were Dr. Rajinder Pal, formerly from the Malaria Institute of India in Delhi, and Dr. Hafezi Ibrahim, Cairo, Egypt.

"I was royally entertained in Cairo," Dr. Daggy wrote, "by Dr. Mahdwar of the Insect Eradication Service who had enjoyed his visit in Atlanta last winter. All of you people in Atlanta should be proud of the very great respect in which CDC is held and the world wide reputation it is gaining."

ADMINISTRATIVE DIVISION

Mr. Tremmel, Administrative Division Chief, visited District 4 office in New Orleans, Louisiana the early part of April and in June went to Washington for conference with USPHS officials.

Supply Officer E. R. Johnston, Purchasing Officer K. A. Ford, and Administrative Division Chief George B. Tremmel, attended a session of the Conference of District Administrative Assistants held in Washington on May 7, 8, and 9.

Mr. Ginn, Personnel Officer, visited the Technical Development Division in Savannah and field stations of Arkansas, Missouri, and Oklahoma. He also visited the headquarters of the Ninth Civil Service Region in St. Louis and reached an agreement with officials there on qualification standards for Malaria Control Aids to be used until examinations are announced.

Mr. Gervin, Classification Officer, visited the New Orleans office and the Technical Development Division at Savannah. He also made a trip to Washington during the quarter, which resulted in a delegation of classification authority to CDC through the grades of P-4 and CAF-11 for use in occupational series for which standards have already been approved.

In furtherance of the program to estab-

lish all CDC positions on a Civil Service basis so they will be available when needed, descriptions of 11 positions of the P-5 level were submitted to Washington for approval.

Plans were presented by Miss Evelyn Pierce, of the Employment Section in Washington, for a cooperative program whereby the Board of U. S. Examiners in CDC would announce examinations for competitive appointment in all U. S. Public Health Service establishments in the southeast area of the United States. This plan met with the approval of Headquarters personnel and of the Regional Director of the Fifth U. S. Civil Service Region.

An announcement of examination for probational appointment of entomologist, bacteriologist, immunologist, mycologyst, serologist, virologist, biologist, chemist, and parasitologist is now pending in the Fifth U. S. Civil Service Region. Preliminary work has been done on an announcement of examinations for Typhus Control Aid, SP-3 through SP-8, and Typhus Control Specialist, P-3.

A $69 contribution was made by CDC Headquarters employees to the national cancer campaign.

ENGINEERING DIVISION

Visits were made by the Chief and Assistant Chief of the Engineering Division to five state CDC programs during the quarter.

Division Chief Frank Tetzlaff visited the District 1 office to discuss the activities of District 1 CDC personnel. In early May, Mr. Tetzlaff went to Washington to attend the annual meeting of District Engineers and to present a discussion of CDC operational activities at the Conference of State Sanitary Engineers.

A similar visit to Washington was made in late June by Assistant Division Chief Chris A. Hansen to present a discussion of CDC operational activities during the orientation course for new Public Health Service commissioned personnel.

An inspection trip to the Tennessee Valley Authority was made in May by Mr. Tetzlaff and Mr. Nelson H. Hector, Engineer in Charge of the Impounded Water Branch.

In June, Mr. Tetzlaff accompanied Dr. J. M. Andrews, Deputy Officer in Charge, to Puerto Rico. The primary purpose of the visit was to investigate the proposed *Anopheles albimanus* eradication project on the Island of Vieques. A detailed report of the proposed Vieques project is in process of preparation at the present time.

Table III
SUMMARY OF DDT RESIDUAL SPRAY OPERATIONS

March 22, 1947 - June 30, 1947										CUMULATIVE July 1, 1946-June 30, 1947	
STATE	NO. COS.	NO. HOUSES SPRAYED	LBS. DDT	MAN-HOURS CDC	MAN-HOURS LOCAL	MAN-HOURS TOTAL	LBS. DDT PER HOUSE	M.H. PER HOUSE	M.H. PER LB. DDT	TOTAL HOUSE SPRAY APPLIC.	TOTAL LBS. DDT
Alabama	21	68,058	57,958	53,956	23,346	77,302	0.85	1.14	1.33	135,926	112,911
Arkansas	38	87,376	78,500	21,025	98,657	119,682	0.90	1.37	1.52	179,332	133,691
Florida	18	30,670	24,515	7,164	38,156	45,320	0.80	1.48	1.85	59,619	48,858
Georgia	52	126,421	98,088	33,020	91,294	124,314	0.77	0.98	1.26	203,803	177,457
Kentucky	9	11,207	10,250	2,320	23,184	25,504	0.91	2.27	2.49	18,171	14,202
Louisiana	12	39,449	29,779	22,376	15,360	37,736	0.75	0.96	1.27	71,400	57,043
Mississippi	18	98,887	71,034	66,396	49,364	115,760	0.72	1.17	1.62	188,212	131,480
Missouri	7	38,261	20,283	16,865	20,028	36,893	0.53	0.96	1.82	71,030	40,004
North Carolina	5 areas	37,886	25,606	4,348	30,079	34,427	0.68	0.91	1.34	58,829	41,030
Oklahoma	10	18,731	19,081	2,356	31,326	33,682	1.02	1.80	1.77	35,279	34,821
South Carolina	27	86,003	56,148	11,244	85,918	97,162	0.65	1.13	1.73	127,273	85,468
Tennessee	12	25,277	30,853	9,758	29,724	39,482	1.22	1.56	1.28	40,315	43,959
Texas	29	43,890	38,018	37,675	36,954	74,629	0.86	1.70	1.96	89,600	71,610
Total	258	712,116	560,113	288,503	573,390	861,893	0.79	1.21	1.54	1,278,789	992,534

During the course of the visit, the CDC residual spraying project for the control of filariasis on St. Croix, V. I., the CDC typhus control project on St. Thomas, V.I., and CDC operations on the Island of Puerto Rico were inspected in detail.

PROGRAM ACTIVITIES AND PROGRESS

MALARIA CONTROL. Residual spraying activities continued at an accelerated rate during the quarter. Many early season difficulties with emulsion and equipment were overcome and activities in all states were expected to reach the season's maximum by the end of the quarter. Data on hand indicate that by June 30 spraying activities had been undertaken in 315 counties (246 pre-approved and 69 approved by reason of additional epidemiological justification). With the onset of the mosquito breeding season, states operating on the fee system of local participation found it easier to collect assessments from householders, and local and state contributions for spraying activities reached a new high during the quarter.

Since June 30, 1947 CDC participation has consisted of consultative services and the loan of automotive and other equipment available at Headquarters. Personnel cost and other expenditures paid by CDC funds were transferred entirely to state and local health departments by end of the first quarter. Formerly these projects operated on approximately 50 percent local and state funds and 50 percent CDC funds.

Table VII
AEDES AEGYPTI OPERATIONS
April 1 - June 30, 1947

STATE	PREMISES INSPECTED	PREMISES BREEDING	INDEX
Alabama	24,266	29	0.11
Florida	28,289	689	2.5
South Carolina	14,417	141	0.9
Texas	71,647	23,790	33.2
Total	138,619	24,649	17.7
Cumulative, F. Y. 1947	605,990	41,397	6.8

TYPHUS BRANCH. Representatives of the Typhus Branch prepared a bulletin, "Evaluation Data for Murine Typhus Fever Control Activities, 1946." This consists of 37 figures and 15 tables showing the effect of DDT dusting on the various ectoparasites, typhus in rats and typhus in humans, 1945 to 1946.

The officer in charge of the Typhus Branch presented a brief discussion of typhus control measures and a film strip, "The Ratproofing of Existing Buildings," before the Georgia Pest Control Association in April and the entomologist attached to the Branch presented a discussion of murine typhus fever to some 70 sanitarians, health officers and others attending a training course at the University of Maryland in June.

Representatives of the Typhus Branch rendered assistance in various typhus and rodent control problems to 23 communities in 6 states during the quarter.

There has been considerable objection to the application of DDT dust for control of rat ectoparasites, particularly in residential areas. This often resulted in incomplete coverage of the areas being worked. In an effort to devise a more acceptable method of applying DDT, experimental projects have been initiated in several counties. On these projects DDT spray is being used to spray, rather than dust, rat runs, burrows, and harborages. This method is being evaluated in counties in Alabama, Mississippi, Tennessee, and Texas.

EQUIPMENT AND CONSTRUCTION BRANCH. During the quarter the Construction Unit staff was increased in order to permit more rapid conversion of the buildings made available to the CDC at Lawson Hospital, near Atlanta. It is anticipated that, in all, ten or twelve buildings will be converted for CDC occupancy.

A tool was designed by the Equipment Unit and fabricated by the Headquarters Motor Base to permit the cutting of rubber tips for shut-off valves used on spray cans. The cost of the tips made by the tool

is approximately one-half cent each as compared with five cents each for those purchased on the market. It is contemplated that all tips needed by the field will be made in this Headquarters in the future.

IMPOUNDED WATER BRANCH. During the quarter fourteen malaria survey reports for Corps of Engineer impoundments and three reconnaissance report letters were completed and transmitted to the Corps of Engineers through channels; requests for three additional survey reports were received.

Personnel of the Branch attended a training course provided by the Tennessee Valley Authority during June. New and improved methods of malaria mosquito control on impoundments were observed. Among such methods were airplane application of DDT thermal aerosol; airplane spraying of 2, 4-D for the control of terrestrial, aquatic and semi-aquatic vegetation, residual premise spraying, filling, diking and dewatering, as well as restricted land use in areas where breeding is difficult and expensive to control. Reservoir management and the entomological and biological phases of malaria control were among topics discussed by TVA personnel. Field trips to TVA reservoirs in Tennessee, North Carolina and North Georgia were made to observe control methods applicable to the impoundments in question.

AIRPLANE LARVICIDING OPERATIONS. During the quarter the Communicable Disease Center in cooperation with the Mississippi River Commission carried on an airplane larviciding project at the Sardis and Arkabutla reservoirs in Mississippi for the control of malaria mosquitoes. A CDC plane equipped for the dispersion of DDT thermal aerosol and the services of a CDC pilot were made available to the Mississippi River Commission on a reimbursement basis. It is not contemplated that this project will continue after June 30 since the future work will be done on a contract basis.

In response to a request from the Arkansas CDC program, emergency airplane larviciding with DDT thermal aerosol was initiated in the flooded areas at Forrest City, Helena, West Memphis, and Marianna, Arkansas late in June.

Specifications for DDT concentrate, solvents, emulsifiers, 10 percent DDT dust and various types of nozzles were furnished the CDC District representative during the quarter. Cost Data for various chemicals used on CDC operating programs were also forwarded to the District Representatives. Such material should be of considerable assistance to states desiring to purchase chemicals and equipment for DDT spray programs for general sanitation purposes.

Inquiries from the Netherlands, China and Saigon regarding CDC operations were received during the quarter and, in the latter request, detailed plans for the conversion of airplanes for the dispersal of thermal aerosols were furnished.

EPIDEMIOLOGY DIVISION

Senior Assistant Surgeon (R) Mildred A. Morehead entered the Baltimore Marine Hospital for an operation. Doctor Morehead will not return to duty with CDC since her period of convalescence will probably extend until the time she plans to enter the Harvard School of Public Health.

During the month of April Senior Assistant Surgeon John W. Smillie attended a week's course of instruction on the pathology, treatment, and diagnosis of poliomyelitis at the Georgia Warm Springs Foundation.

EPIDEMIC AID PROGRAM

Two additional requests for assistance in ringworm of the scalp studies were received from the states of Georgia and Florida. The Georgia request was for aid to the City of Atlanta. The Florida request was for aid to the cities of Jacksonville and Miami. Doctor Morehead actively assisted in the institution of treatment clinics in Atlanta and gave advise on surveys being conducted in Jacksonville and Miami.

Doctor Link accompanied Doctor Mountin on a trip to Pharr and Lubbock, Texas, and also accompanied Consultant Dr. William F. Friedewald of Emory University Medical School on a trip to Montgomery for the purpose of reviewing epidemiological and laboratory procedures to be

Blood serum for precipitin test is extracted from the filter paper and placed in a series of capillary tubes. Here antisera are being placed in the tubes below the diluted blood serum.

undertaken by the Neurotropic Virus Disease Insect Control Project.

Dr. Elmer C. Hill discussed the work of the Typhus Investigations Project before the Georgia Public Health Association Annual Meeting.

ENTOMOLOGY DIVISION

Mr. G. H. Bradley visited Atlantic City, New Jersey, on April 2, to present a paper entitled "Mosquito Control Activities of the Communicable Disease Center" by G. H. Bradley and F. Earle Lyman.

Dr. F. Earle Lyman made trips to Jacksonville and New Orleans early in April in connection with USED water-hyacinth eradication experiments. Both mechanical cutting and 2,4-D poisoning are being recommended since each has a place in the eradication program.

Arrangements were made to continue CDC assistance to the tick control experiments being carried on by the Georgia State Board of Health under Drs. Bowdoin and McCroan in areas in Fulton and DeKalb Counties where Rocky Mountain Spotted Fever has been contracted.

The first 21 pages of plates and text for the RAT ECTOPARASITE ATLAS were released June 28. It is hoped that other issues of material can be made in the near future. The Atlas is being prepared to give assistance to entomologists and others on the typhus control program who must identify these arthropods taken from rodents.

LABORATORY DIVISION

OFFICE OF THE CHIEF. Dr. Seward E. Miller delivered papers on "Laboratory Medicine" before the dinner meeting of the Kansas Laboratory refresher course on May 26, 1947 and on "Epidemiology and the Public Health Laboratory" before the Annual Meeting of the Kansas Public Health Association on May 27, 1947 at Wichita, Kansas. Dr. Miller presented the major activities being undertaken by CDC in order to supplement and strengthen the services of the state and local laboratories. These concern 1) improvement of laboratory techniques

with the goal in mind of evaluating all bacteriological-pathological laboratory procedures and ascertaining their sensitivities and specificities and 2) strengthening the epidemiological investigations carried on by CDC for State Health Departments by providing adequate epidemiological teams and mobile laboratories where such facilities are not readily available.

A program review of the Virginia State Health Department laboratories was made by Dr. Seward E. Miller on June 17-19, 1947.

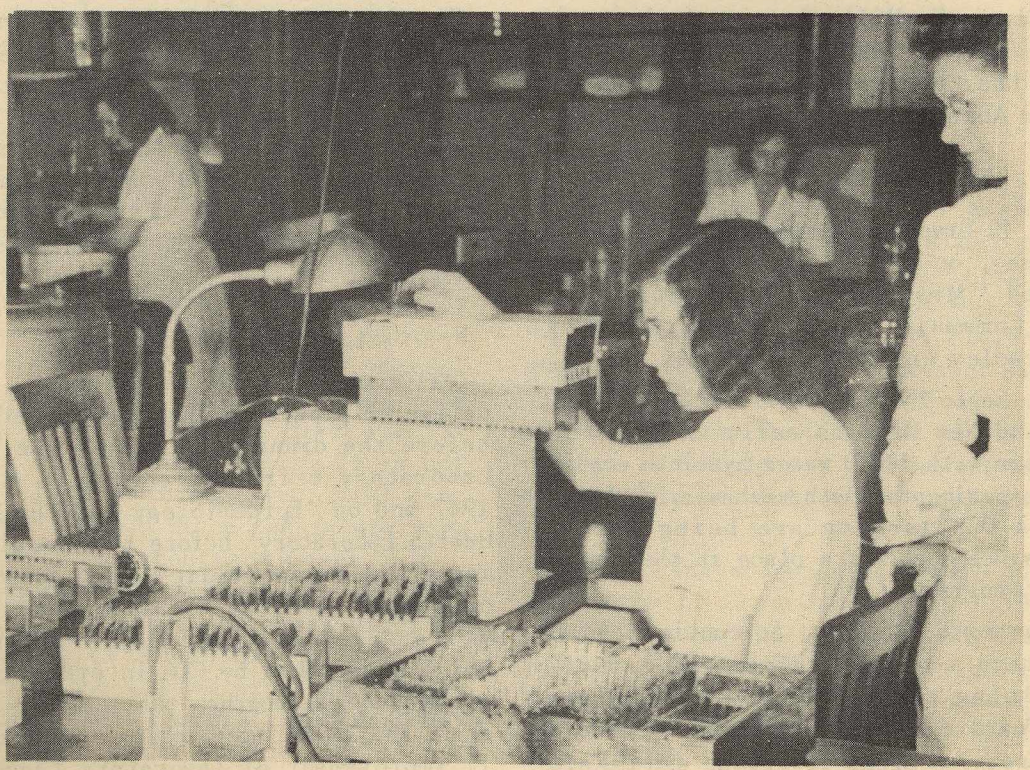
VIRUS DISEASES BRANCH, MONTGOMERY, ALA. Miss Beatrice Howitt presented a paper on "The Complement-Fixation Test in Virus Diseases" at the Annual Meeting of the Alabama State Technician Society held in Birmingham, Alabama.

A study is being initiated to compare the merits of the anti-hemagglutination test with the complement-fixation test as diagnostic procedures for mumps. Sera has been obtained from several recently recovered human cases, as well as from older ones and from the chickens. It is evident that it is always necessary to have both early and late bleedings in order to evaluate the anti-hemagglutination tests because of the positive results that invariably occur in nearly all sera through the lower range of the dilutions.

Dr. Tierkel of the Rabies Demonstration Control Project, Montgomery, Alabama, represented CDC at a special medical staff meeting at the AAF Regional Hospital, Maxwell Field, Alabama on May 6, 1947. The U. S. Public Health Service representative reviewed the indications for anti-rabies vaccine treatment.

The Southern States Regional Conference on Rabies held in Atlanta, Georgia, on June 12-13 was attended by Dr. Tierkel as the CDC representative. Most of the southern states sent delegates from state and local health departments. Other government agencies represented were the U.S.

To determine source of mosquitoes blood meal, capillary tubes containing blood serum and antisera are examined with transmitted light. Precipitate at interface of the solutions indicates positive reaction.



Bureau of Animal Industry and the U. S. Fish and Wildlife Service. The representatives from each of the states presented a resume of their own rabies control activities. The three Federal Government delegates gave their views on projected control programs and suggestions for improving the rabies control status of the several states.

PARASITOLOGY BRANCH. In accordance with the association between CDC and Emory University, the staff of the Parasitology Branch gave a course in Medical Parasitology to the second year medical students of Emory University. All the lectures and laboratory sessions were held at Grady Hospital and the teaching materials of CDC were used in this course. The course was attended by 42 medical students and 2 medical technicians. A number of the members of the Grady Hospital staff attended the lectures.

The seventh course in the Laboratory Diagnosis of Parasitic Diseases for laboratory personnel was held between April 7 and May 16, 1947. A total of 15 students representing 9 states attended the course.

Dr. M. M. Brooke spent three weeks (June 8-30) at the School of Tropical Medicine in San Juan, Puerto Rico. Tests were performed on the value of the phase microscope in the diagnosis of parasitic diseases. A number of fresh specimens were studied which are not available in the continental United States. This occasion also made it possible for a member of the Atlanta Staff to become better acquainted with the activities of the Parasitological Field Unit and the School of Tropical Medicine as well as to observe some of the parasitological problems of Puerto Rico.

Serological tests to determine the source of the blood meal of anopheline mosquitoes were originally begun in Savannah, Georgia, and later transferred to the Montgomery, Alabama, laboratory. On April 14, two of the technicians who have been doing this work were transferred to the Laboratory Division in Atlanta. They will continue this host preference serology work on a reduced scale, receiving carefully selected specimens from two principal areas, the Malaria Field Investigations Station in Manning, South Carolina, and the Emory University Field Station in Newton, Georgia. Arrangements have also been made to receive small shipments of specimens from Dr. H. S. Trapido, Gorgas Memorial Laboratory in Panama, in connection with the residual DDT work being done there. A total of 3,518 mosquito specimens have been tested since the work in Atlanta began.

TUBERCULOSIS SECTION. The Tuberculosis Section, financed by the Tuberculosis Control Division, came into being in the last quarter of the 1947 Fiscal Year. The section is a part of the Laboratory Services directly responsible to the Chief of Laboratory Division, with functions of evaluation of laboratory methods, specimen identification and applied research. Work is to be carried out at Lawson Hospital where laboratory space was acquired from the Veterans Administration. A building has been completely renovated and is being equipped to start routine procedures in the next quarter.

PRODUCTION DIVISION

The Production Division has begun moving to Lawson Hospital. The office of the Chief of the Division and most of the branches now occupy quarters at Lawson. All equipment has not been moved, and it will be several weeks before entire operations can be carried on from the new offices.

New releases by Production Division include the following:

"DDT AS A MOSQUITO LARVICIDE"

An instructional film designed to train field crews and other persons involved in mosquito control on how to use DDT as a larvicide. All sequences are photographs except for some animated lines showing plans for thorough coverage of ponds. Demonstrations are given on how to mix DDT, how to prepare and operate the equipment, how to apply the solution to various types of ponds and ditches, and how to care for the equipment. Special emphasis is placed upon correct procedure for thorough larviciding of ponds.

Production Number: 4-035.2

16mm Sound Motion Picture

Photography: black and white
Running time: 18 minutes

"IN SELF DEFENSE"

This is a sequel to the film strip "Criminal at Large." It tells in story form what the individual can do to protect himself and his community from malaria. Sam Snoop, the cub reporter for Scoop magazine, again pantomines his experiences to point a moral and adorn a tale.

Production Number: 5-016.0
35mm, Sound Film Strip
Photography: Color
Length: 68 Frames

"YOUR KEY TO THE MALARIA PROBLEM"

A sound film strip showing the geographic distribution of malaria and the role which the *Anopheles* mosquito plays in the transmission of the disease. Mosquito control is emphasized as the chief medium of malaria control, and the life history of the mosquito is described in detail. Mosquito control measures to be applied by individual householders are given emphasis, although public mosquito control measures are shown.

Production Number: 5-032.0
35mm, Sound Film Strip
Photography: black and white
Length: 49 Frames

"IDENTIFICATION OF U. S. GENERA OF MOSQUITO LARVAE"

A film strip designed to present the essential larvae characters used in determining genera of U. S. mosquito larvae. Methods of distinguishing mosquito larvae from other insect larvae and basic nomenclature used in larvae taxonomy are described. Projected at the college level for entomology students, entomologic technicians, and advanced entomologic inspectors.

Production Number: 5-042.0
35mm, Sound Film Strip
Photography: Color
Length: 102 Frames

"FIELD ACTIVITIES, TRAINING DIVISION"

This film strip depicts the activities of the various field training stations of the Training Division. These activities are shown as follows: Savannah — inspection activities in a fish shed or packing house; Columbus — inspection of restaurants, pasteurizing plants and sewage disposal plants; Albany — malaria field training activities; Topeka — points of interest at the field training station; Atlanta — activities of the Training Division headquarters.

Production Number: 5-099.0
35mm, Silent Film Strip
Photography: black and white
Length: 54 Frames

"CDC SLIDE SERIES"

This set of slides shows the administrative organization of CDC and gives a breakdown by divisions, depicting the function, relationships, and scope of activity for each.

Production Number: 9-011.0
Set of 13, 3¼" x 4" slides for use in a stereopticon.

TECHNICAL DEVELOPMENT DIVISION

COMBINATIONS OF DDT AND CHLORDANE ($C_{10}H_6C_{18}$) AS RESIDUAL SPRAYS AGAINST HOUSE FLIES AND MOSQUITOES

Tests have been initiated to determine the value of combining chlordane and DDT in a residual spray formulation. In such a combination spray the more rapid knock-down action of the chlordane might act to advantage with the long residual effectiveness of the DDT. Three combinations are under test, namely (1) 100 percent DDT as a standard for comparison, (2) 80 percent DDT with 20 percent chlordane, and (3) 60 percent DDT with 40 percent chlordane. Finished sprays were formulated to contain five percent of the combined test chemicals and applied to plain plywood test panels at the rate of 4 ml. per sq. ft. or 200 mg. of the test chemicals per sq. ft. Both the house fly, *M. domestica,* and the malaria mosquito, *A. quadrimaculatus,* were used as test insects. The house flies were exposed for 30-minute periods, while the mosquitoes were tested with both 30- and 60-minute periods. The results shown in table 1 were based on the 24-hour mortalities of the adult female insects in all cases.

While the laboratory results as shown in

table 1 are only preliminary and must be further checked in the field, certain initial observations are apparent. The substitution of chlordane for some of the DDT in the finished spray has given increased mortalities of *A. quadrimaculatus* adult females during the first 6 weeks after spray application. The results against house flies under similar test conditions have not shown any marked difference during the first six weeks after application. Under similar exposure periods to DDT residual insecticides, as has been previously reported, the house fly shows a higher susceptibility than the malaria mosquito.

Table I

TWENTY-FOUR-HOUR MORTALITIES OF ADULT FEMALES OF *M. DOMESTICA* AND *A. QUADRIMACULATUS* AFTER 30-MINUTE AND 50-MINUTE EXPOSURE PERIODS TO 200 MG. PER SQ. FT. DEPOSITS OF DDT OR DDT-CHLORDANE COMBINATIONS

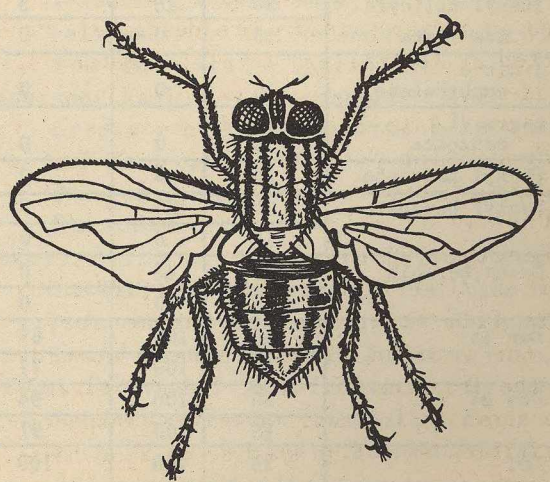
Test Formula Percent-	Test Insect	Exp. Time (min)	Age of Residue (weeks)				
			1/2	2	4	6	8
100-DDT	*M. dom.*	30	—	100	100	100	100
(xylene)	*A. quad.*	30	100	—	—	38	
		60	100	—	—	71	
80-DDT 20-chlor-	*M. dom.*	30	—	100	100	97	100
dane	*A. quad.*	30	95	—	—	54	
(xylene)		60	100	—	—	98	
80-DDT 20-chlor-	*M. dom.*	30	—	100	99	100	99
dane	*A. quad.*	30	100	—	—	96	
kerosene		60	100	—	—	100	
60-DDT 40-chlor-	*M. dom.*	30	—	100	100	100	100
dane	*A. quad.*	30	100	—	—	98	
(xylene)		60	100	—	—	100	

In table 1 it may be emphasized that the chlordane sprays having kerosene as the slovent are somewhat more effective than those sprays made with xylene as the solvent under the same test conditions. This has been shown previously (Summary of Activities No. 7, 3rd quarter, 1946) and is further verified by the present series.

EVALUATION OF SOME POTENTIAL RESIDUAL INSECTICIDES AGAINST ADULT HOUSE FLIES AND MOSQUITOES

RAPID SCREENING TEST. It has been necessary to develop a rapid technique for the preliminary evaluation of chemicals with potential residual toxicities. Candidate chemicals are tested as 5-percent solutions in kerosene or xylene. One ml. of the test solution is distributed from a pipette over a 6"x6" area of a glass surface and allowed to dry for several days to eliminate any solvent. Samples of approximately twenty-five adult house flies confined in a petri dish are placed on the test surface. At 3-minute intervals over a 15- or 30-minute period counts are made of the flies 'knocked down' or incapacitated and of the flies on the sides and top of the petri dish. At the end of the exposure period the flies are transferred to a wire holding cage, supplied with food and water, and after twenty-four hours the mortalities of each sex are determined. With each test run a similar control test is conducted simultaneously with the flies exposed to plain glass only. Three 30-minute exposure period tests are run first, and if the chemical shows any promise, three 15-minute tests are run. Those chemicals showing definite toxicity with the 15-minute exposures are then subject to more detailed tests with standard test panels which do not accentuate any

Musca domestica



possible fumigating action as does the presently described test.

A 5-percent-DDT solution in kerosene was used as the standard formulation for comparative purposes. Tests with this solution were made over a range of exposure periods, and the results are shown in table 2.

Table II

TWENTY-FOUR-HOUR MORTALITIES OF ADULT *M. DOMESTICA* AFTER VARIOUS EXPOSURE PERIODS TO DEPOSITS OF 200 MG. DDT PER SQ. FT. ON GLASS TEST SURFACES

Exposure Period (Minutes)	24-hour Mortality (percent)	
	Males	Females
1	100	16
2	100	46
4	100	53
6	100	59
10	100	100
15	100	100
30	100	100

Some chemicals tested by the above method have given results as shown in table 3.

Table III

TWENTY-FOUR-HOUR MORTALITIES OF ADULT *M. DOMESTICA* AFTER 30- AND 15-MINUTE EXPOSURES TO DEPOSITS OF 200 MG. PER SQ. FT. OF VARIOUS CHEMICALS TESTED RESIDUAL TOXICITY

Test Chemical	Exposure Period (Minutes)	24-hour Mortality (percent)	
		Male	Female
Thenyl benzoate	30	0	0
Thenyl salicyl-	30	16	3
ate ate	15	0	0
1-nitro naphthalene	30	0	0
p-cresyl benzoate	30	0	0
Phenyl benzoate	30	0	0
Benzyl benzoate	30	100	0
	15	0	0
Desoxybenzoin	30	43	0
	15	0	0
Dow 3X	30	100	89
	15	100	71
Dow 2X	30	100	94
	15	100	97
DDT	15	100	100

Of these chemicals only the Dow 2X and 3X were considered for further more detailed tests with standard panels. The active ingredient in these compounds is a chlorinated diphenyl oxide.

STANDARD PANEL TESTS. The methoxy derivation of DDT, di(methoxyphenyl) trichloroethane, also known as dianisyl trichloroethane, is under test at 100 and 200 mg. per sq. ft. using xylene emulsions and kerosene solutions as the test formulations. Initial results against both mosquitoes and flies demonstrate the toxicity of the compound to be equal to DDT for the first five weeks after spray application. The same material applied as a water-wettable powder has also given equal results over a five-week period. The water-wettable powder however will leave a visible residue and could not be used in house applications.

EVALUATION OF THE USE OF SPREADING AGENTS IN LARVICIDE PREPARATIONS

The adding of a spreading agent to solutions applied as a mosquito larvicide has not been fully evaluated; therefore, replicate tests with DDT in solution with No. 2 fuel oil with and without a spreading agent first used was EMULPHOR DDT. This was selected because of promising results of tests made in the laboratory. Results of the tests made at dosages below 0.05 pound of DDT per acre are included in table 5.

The volume of solvent used in these tests was reduced to one-half gallon per acre, since it was felt that if the spreading agent was of any significant value it would be more clearly shown at the reduced volume. However, as in tests made at the same insecticide dosages in the comparisons of DDD and DDT, the results in the different individual tests were very erratic. The mortality of the larvae 24 hours after treatment, based on a weighted average of all plots, seemingly indicates that treatments in which no spreading agent was added were slightly more effective than those which contained a spreading agent. Since the results were so erratic in the individual test plots, this dif-

Table V

RELATIVE EFFECTIVENESS OF TWO DIFFERENT CONCENTRATIONS OF DDT LARVICIDES IN COMBINATIONS WITH AND WITHOUT A SPREADING AGENT

Rate of Application per Acre	Spreading Agent	No. of Replicats Treatments	Average Percent Larval Mortality	
			1 day	3 days
DDT 0.0125 lb., Fuel Oil ½ gal.	Emulphor-DDT 1%*	7	57	31
DDT 0.0125 lb., Fuel Oil ½ gal.	None	8	67	36
DDT 0.025 lb., Fuel Oil ½ gal.	Emulphor-DDT 1%*	9	64	36
DDT 0.025 lb., Fuel Oil ½ gal.	None	11	78	42

* A product of General Dyestuff Corp. of New York.

ference is of doubtful significance. Moreover it is quite conceivable that the use of this or some other spreading agent might appreciably increase effectiveness under other circumstances.

TRAINING DIVISION

NEW YORK STATE TRAINING STATION. Negotiations have been completed with the New York State Department of Health for the organization of a field training center at Troy, New York. An agreement was drawn up and signed by the cooperating agencies - the New York State Health Department, the Rensselaer County Health Department, the District No. 1 Office of the U. S. Public Health Service, and the Training Division of the Communicable Disease Center, U. S. Public Health Service.

CINCINNATI, OHIO, TRAINING STATION. A visit by CDC officials to the Cincinnati, Ohio, Water and Sanitation Investigations Station of the U. S. Public Health Service resulted in the draft of an understanding to establish a new field training station at Cincinnati to give short practical training programs to sanitary engineers concerned with the administration of water, sewage, and stream pollution control programs. Also, a laboratory training course was proposed of approximately three weeks length in the sanitary analysis of water and sewage for chemists and bacteriologists.

TRAINING PROGRAMS UNDER WAY IN LAST QUARTER OF 1947. Regular scheduled training programs were carried on at Savannah, Columbus, Albany, and Atlanta during this quarter.

SAVANNAH, GEORGIA. Thirteen sanitarian trainees from the five states, Colorado, North Dakota, North Carolina, South Carolina, and Georgia, began the twelve weeks field training program on May 12.

Four trainees completed the first course for record analysts conducted April 15 – June 7. This course will be improved and revised to six weeks in length, and will be repeated in September.

COLUMBUS, GEORGIA. Twelve graduate sanitary engineers from five universities and three foreign countries reported to the field station June 23 to participate in the twelve weeks' practical program in sanitary engineering under the direction of the field training station staff.

The sanitary engineers and the universities from which they come have been noted to show how widely this service is being rendered:

Alexander, Aleck – Boise, Idaho.
Graduate of Johns Hopkins University. Fellowship by the National Foundation for Infantile Paralysis.

Anderson, Earl J. -- Cincinnati, Ohio.
Graduate of Massachusetts Institute of Technology. Fellowship by the National Foundation of Infantile Paralysis.

Baker, Ralph H. Jr. -- Winthrop, Mass.
Graduate of Massachusetts Institute of Technology. Fellowship by the National Foundation of Infantile Paralysis.

Canham, Robert A. -- West Lafayette, Indiana
Graduate of Purdue University, Fellowship by the National Foundation for Infantile Paralysis.

Eichenberg, Urano C. – Porto Alegre, Brazil
Graduate Civil Engineer from the Porto Alegre University in Brazil. Graduate of University of Michigan. Fellowship through Office of Inter-American Affairs.

Hobbs, Gregory J. -- Gainesville, Florida
Graduate of University of North Carolina. Fellowship by the National Foundation for Infantile Paralysis.

Macomber, Ronald G. – Fairpoint, New York
Graduate of Harvard University. Fellowship by the National Foundation for Infantile Paralysis.

Murthy, N. Krishna – Mysore, India
Graduate of Mysore University College of Engineering. Graduate of Harvard University. Fellowship by Government of India.

Sanches, Walter R. – Bahia, Brazil
Graduate Civil Engineer from the Polytechnic School At Bahia, Brazil. Graduate of Harvard University. Fellowship through Office of Inter-American Affairs.

Snyder, Charles W. -- Arlington, Virginia
Graduate of Johns Hopkins University. Fellowship by the National Foundation for Infantile Paralysis.

Wang, L. -- Nanking, China

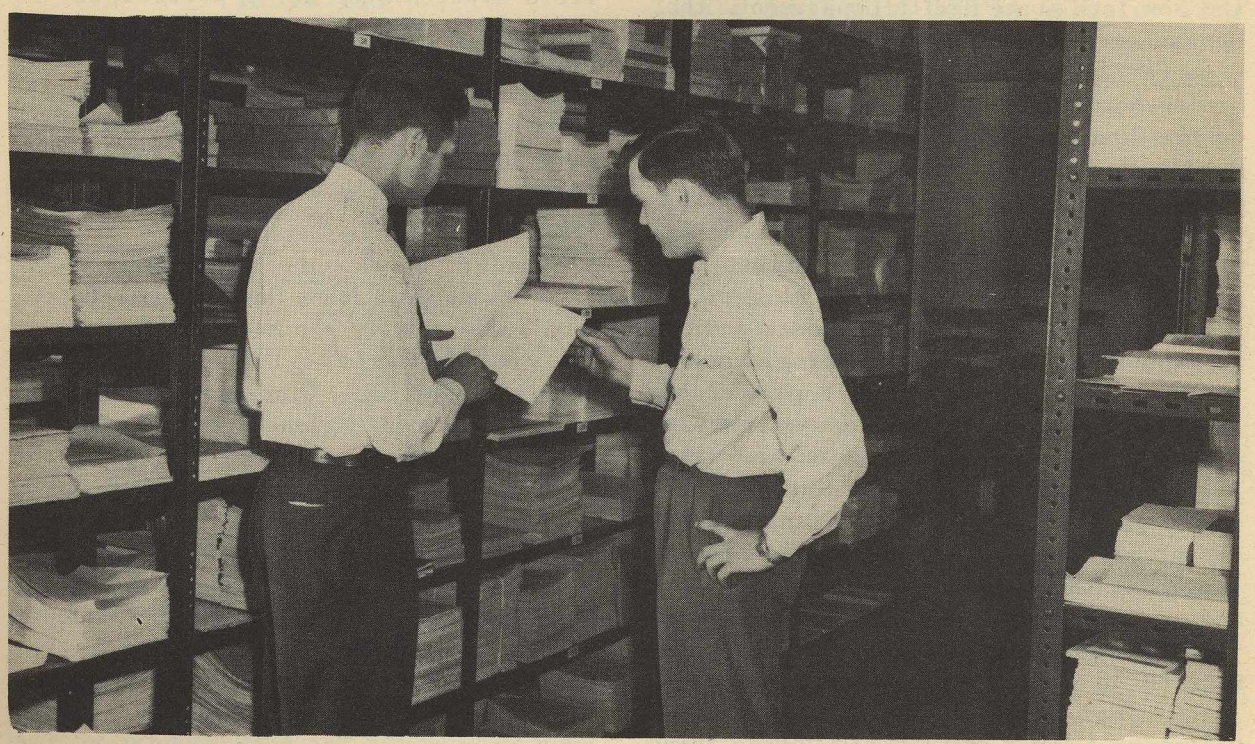
Weinberger, Leon W.– Long Island City, N.Y.
Graduate of Massachusetts Institute of Technology. Fellowship by the National Foundation for Infantile Paralysis.

ALBANY AND ATLANTA, GEORGIA. Twenty-two visitors from eleven foreign countries completed the malaria, typhus, and sanitation programs at Atlanta and Albany from April 1 to June 30.

TOPEKA TRAINING CENTER. The activities of the Topeka Field Training Center were centered on two activities, namely, (1) securing and organizing new and enlarged quarters for the Center, and (2) developing an Instructors Manual for the course in training in environmental sanitation.

NEW FIELD TRAINING PROGRAMS PLANNED AND UNDER DEVELOPMENT

INDUSTRIAL HYGIENE. Early in the quarter, plans were agreed upon with representatives of the Georgia Department of Public Health and Georgia Tech for the Training Division



All types of printed training materials are available for distribution in the Training Division Supply Room.

to assist with the field training portion of the three months' course in Industrial Hygiene offered to graduate engineers at Georgia Tech. S. A. Engineer (R) Clyde Fehn was assigned to this activity. Seventeen graduate engineers are taking the course which is scheduled from June 16 to August 30.

PUBLIC HEALTH NURSING. Expansion of Scope of Field Training. During June, with the assistance of Senior Nurse Officer Pearl McIver of the Washington headquarters office of Public Health Nursing, arrangements were worked out to transfer S. A. Nurse Officer Madeline Pershing to Atlanta. She will work with consultant public health nurses in the several District offices to stimulate the development of field training areas in the several states.

SANITATION FIELD TRAINING. During June, arrangements were made to consolidate both sanitary engineering and sanitation training at Columbus, Georgia. This was necessary to conserve funds, utilize personnel to the best advantage and meet the demands for expansion of field training facilities. The three months' course for sanitarians planned for Savannah during the fall months will be transferred to Columbus.

HOUSING TRAINING PROGRAM. Special training, a two weeks' intensive program, was given to one of the engineers of the Division in a training program organized at Washington, D.C., through cooperation of the District of Columbia Health Department; the Division of Sanitary Engineering, U. S. Public Health Service; and the American Public Health Association. It is planned to develop training programs in the Hygiene of Housing as the need develops.

ADDRESSES GIVEN BEFORE PROFESSIONAL ORGANIZATIONS IN PUBLIC HEALTH

During May, Mr. Ellis S. Tisdale, Director of the Training Division, spoke before approximately 500 members of the Southern Branch of the A. P. H. A. at Memphis, Tennessee. An opportunity was given to discuss the field training programs with the sanitary engineers and sanitarians from most of the Southern states. Also, at a general session of all public health workers, health officers, nurses, and other sanitation personnel, an over-all picture of the work of the Training Division was set forth.

At Washington, D.C., early in May, Mr. Tisdale addressed the joint conference of the District Engineers and State Sanitary Engineers. The operation of the field training stations was set forth, and a film strip developed by the Production Division was used.

At Wichita, Kansas, late in May, the work of the Topeka Public Health Training Center was presented. The scope and plans for the field training of health officers, public health nurses, and sanitation personnel were discussed.

During June, the work of CDC was presented, audially and visually, to a group of new U. S. Public Health Service officers in the orientation class at Washington, D. C., by the Chiefs of the Engineering, Laboratory, Production and Training Divisions.

MR. HENDERSON APPOINTED CONSULTANT. Appointment of J. M. Henderson of Columbia University, as Consultant for July and August, has made it possible to evaluate the several field training station programs going on at Savannah, Albany and Columbus. One aim of his work was to correlate the field work more closely with public health academic instruction in Sanitary Engineering and the Sanitary Sciences as given in the colleges and universities. Professor Henderson has planned to set forth the most effective pattern for field training as one result of his studies.

Special assistance was rendered the Maryland State Department of Health during June by organizing and carrying on a three day insect and rodent control school in cooperation with U. S. Public Health Service District Office No. 2. This was attended by approximately eighty persons.

Work on the "Rodent Borne Disease Prevention and Control Manual" was practically completed during the quarter. Thirty copies are now being circulated to specialists throughout the country for critical review before the Manual is printed.

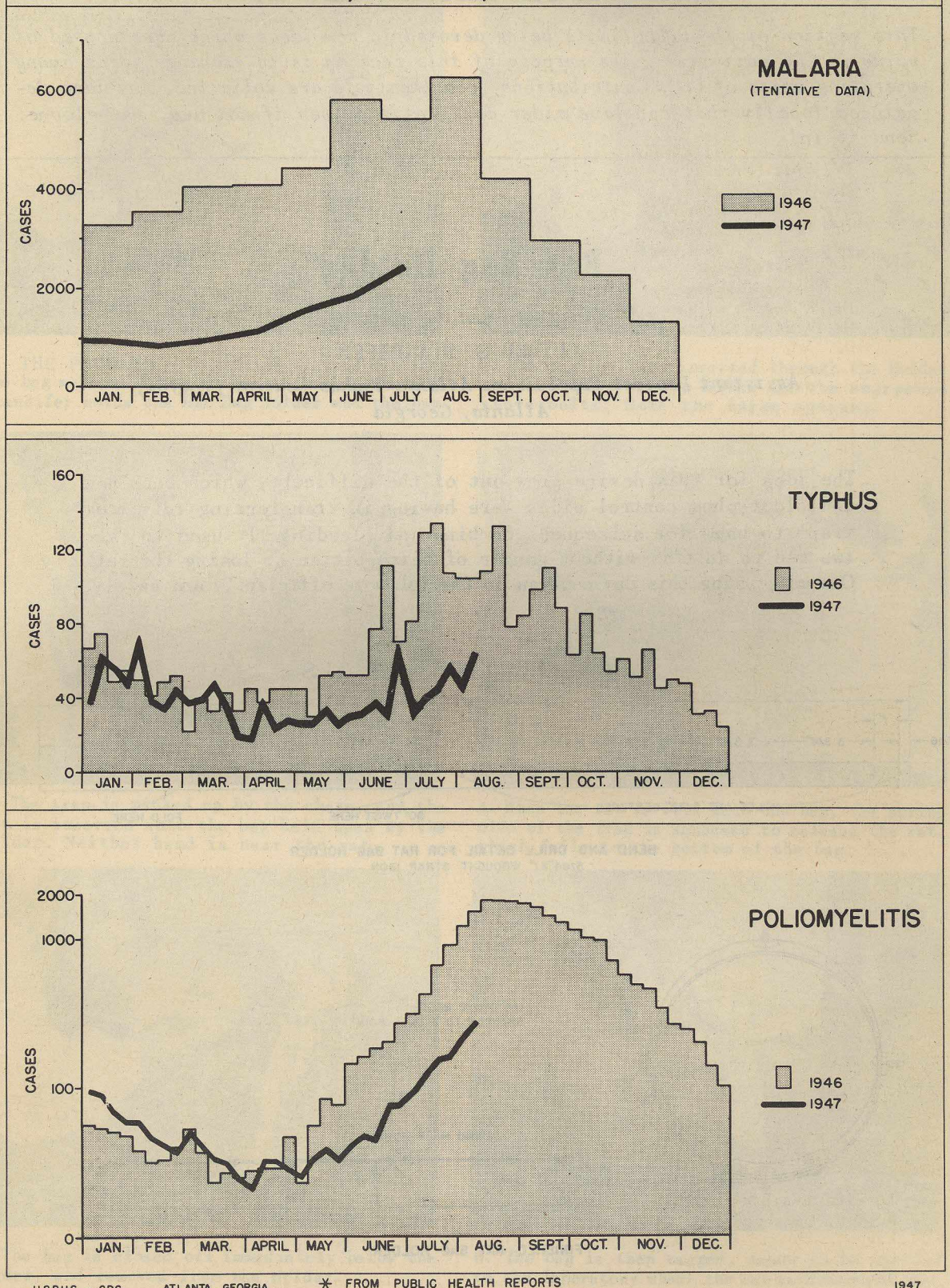
VISITORS. Dr. George Payne, of the Rockefeller Foundation, visited CDC headquarters recently to discuss field training given to foreign visitors who are on Rockefeller scholorships.

Several public health workers from foreign countries recently attended courses conducted by the Training Division. Names of these persons, their country, and sponsoring agency are given below. Photograph at bottom of page was taken while some of the group were on a field trip.

Name	Country	Sponsoring Agency
Mr. Stanley Villafranca	Costa Rico	I.I.A.A.
Dr. Rolf Bergman	Sweden	Office of I.H.R., USPHS
Dr. Victor Bertin	Chile	Rockefeller Foundation
Dr. S. R. Bhombore	India	Rockefeller Foundation
Dr. P. A. D. Peverg	Ceylon	Rockefeller Foundation
Dr. T. H. Wang	China	Rockefeller Foundation
Dr. Keh Chen Hu	China	Rockefeller Foundation
Dr. Peter Issaris	Greece	Rockefeller Foundation
Dr. K'ang Ts'ai Jen	China	Rockefeller Foundation
Dr. Alberto C. Lari	Peru	I.I.A.A.
Dr. Ata Unalan	Turkey	Turkish Government
Dr. Carlos Luis Gonzales	Venezuela	Rockefeller Foundation
Dr. Mohammed Farocq	India	Rockefeller Foundation
Dr. Fonniah Rajasingham	Ceylon	Rockefeller Foundation
Dr. I. W. Teng	China	Rockefeller Foundation
Dr. Y. T. Yao	China	Rockefeller Foundation
Dr. Bichat Rodriques	Brazil	I.I.A.A.
Mr. Guilherme Miranda	Brazil	I.I.A.A.
Mr. Walter C. Taboso	Brazil	I.I.A.A.
Dr. Shy-Min Chiao	China	China Medical Board
Mr. Shou-Wu Lin	China	American Bureau of Medical Aid to China
Dr. Chin Teing Chang	China	American Bureau of Medical Aid to China

Foreign trainees and CDC officers on field trip at Emory University Field Station, Newton, Ga. Front row (left to right) Drs. Ponniah Rajasingham, I Wei Teng, Mohammed Farooq, Alberto C. Lari, Bichat de Almeida Rodriques; Ernest P. Dubuque (CDC); Drs. Ken-Chen Hu, Shu-Min Chiao; Walter C. Taboso; Dr. Ata Unalan. Back row (left to right) Herbert Karp (CDC), Guilherme Miranda and Dr. Carlos Gonzalez.

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



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

IDEA EXCHANGE

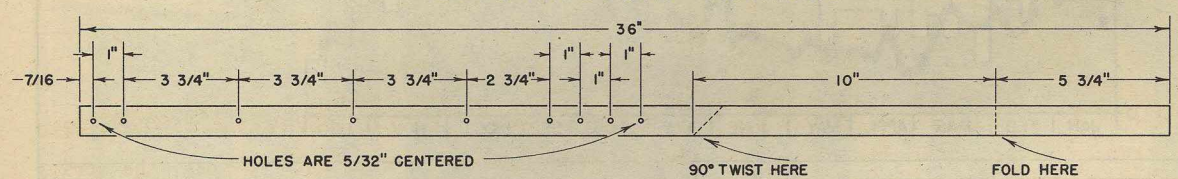
This section of the BULLETIN is being devoted to new ideas which have proved of value in CDC activities. The purpose of this section is to exchange ideas among operating units of CDC. Contributions from the field are solicited. Any idea developed locally that can have wider application, even if not new, is welcome. Send it in!

Rat Bag Holder

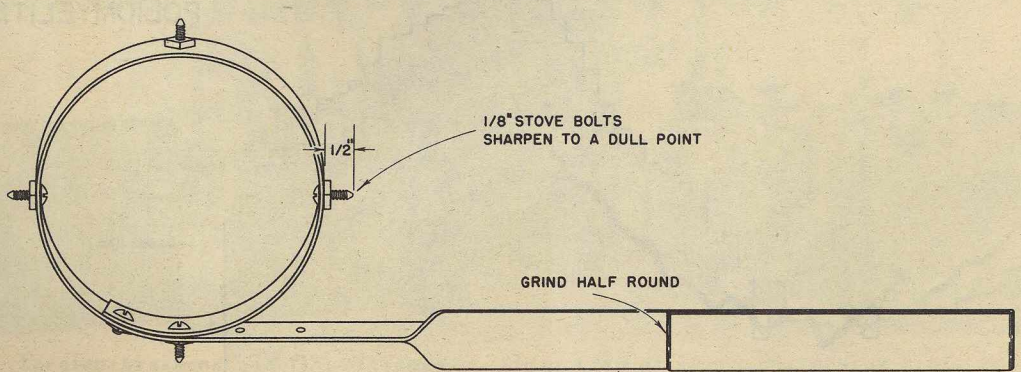
Developed and designed by
LUTHER S. STANDIFER
Assistant Project Supervisor, Atlanta Typhus Control Program, Atlanta, Georgia

The idea for this device grew out of the difficulty which both new and old typhus control aides were having in transferring rats from traps to bags for subsequent combing and bleeding. It used to take two men to do this without danger of being bitten or losing the rat. One man, using this device, can do the job more efficiently and safely.

CONSTRUCTION DETAILS

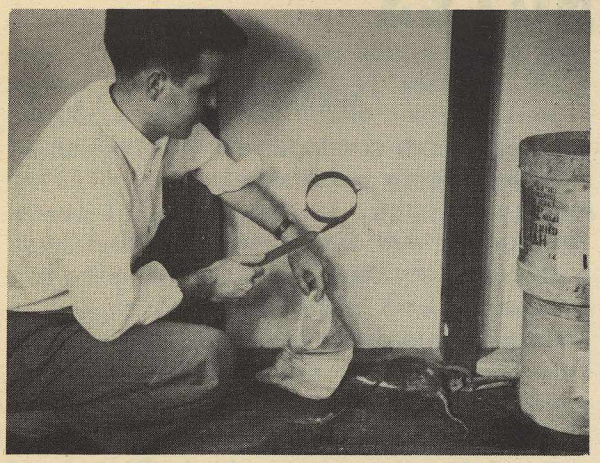


BEND AND DRILL DETAIL FOR RAT BAG HOLDER
5/64"x1" WROUGHT STRAP IRON

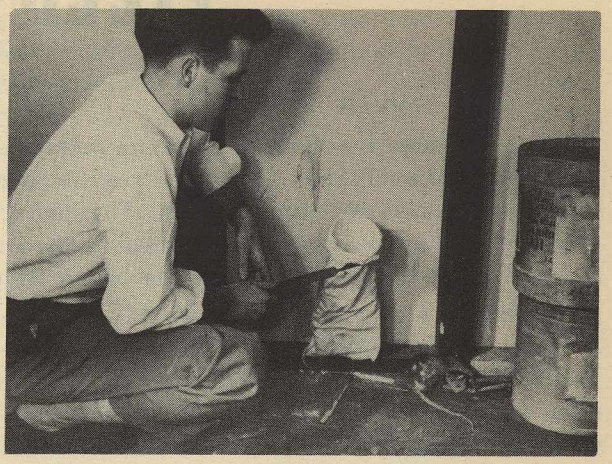


FINISHED RAT BAG HOLDER

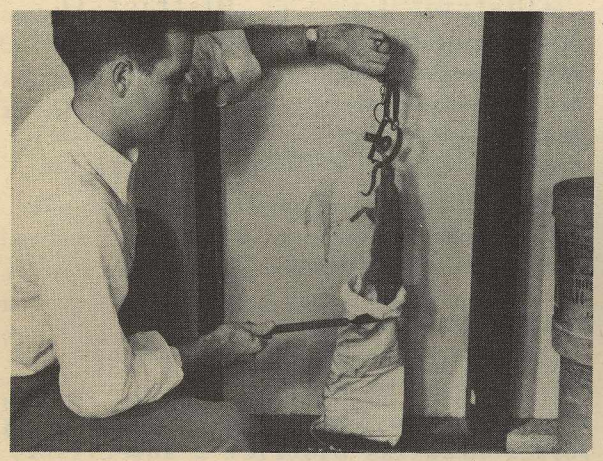
HOLDER IN USE



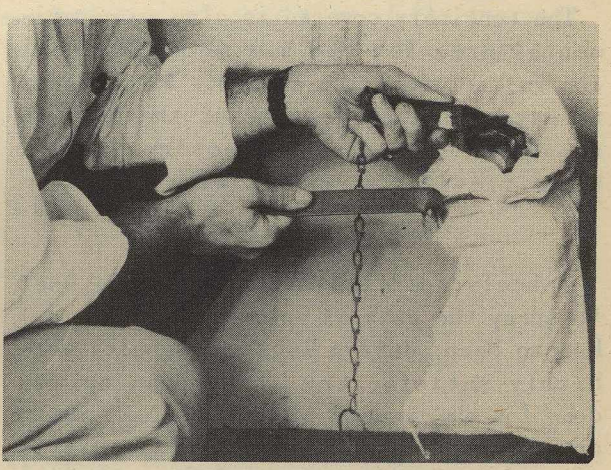
1. THE PROBLEM – To get the trapped rat into the bag without being bitten or losing the rat. Standifer holds the Rat Bag Holder and the bag.



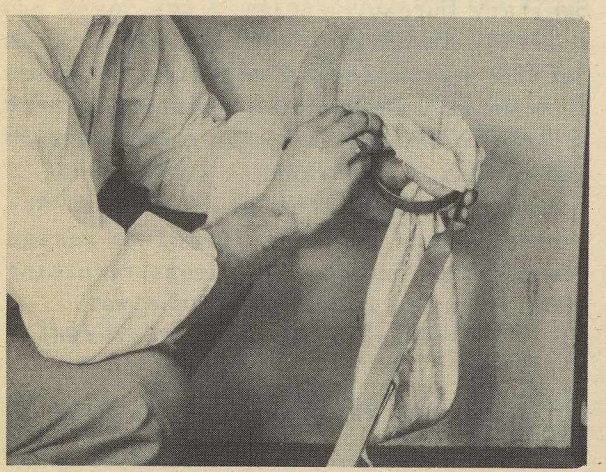
2. The bag has been inserted through the Holder and hooked over the sides on the sharpened stove bolts. Note the large opening.



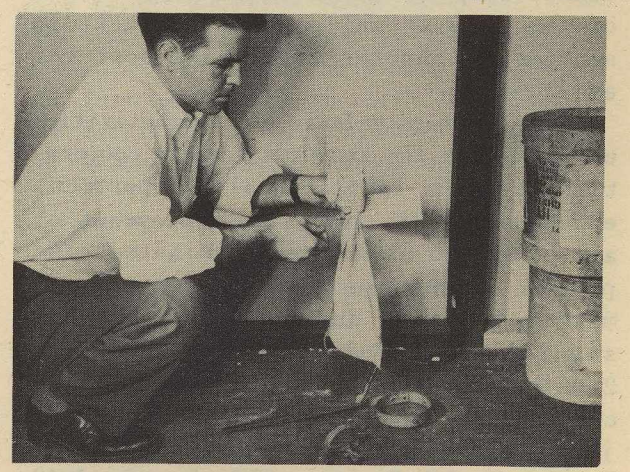
3. The trap is picked up by the chain, and the rat is inserted into the bag held open by the Holder. Neither hand is near the rat.



4. When the rat is well into the bag, the spring clip of the trap is squeezed to release the rat, which falls to the bottom of the bag.



5. The bag is closed off immediately below the Holder, and removed from the Holder.



6. The bag is then tagged, ready to be carried to the laboratory where the rat is combed and bled.

FIELD NOTES

SOUTH CAROLINA

Reports from the South Carolina office state that the Typhus Control Program in Charleston is very successful. The program is locally operated by the County Health Department with only the loan of equipment, and now covers an area consisting of the City of Charleston, Charleston County and Dorchester County. The project has been operating 5 years, during which time reported typhus cases have been reduced from 80 to 11 cases per year. Good ratproofing and rat eradication procedures are being followed.

The territory covered is also an experimental area for the use of 5% DDT dust for rat ectoparasite control. Indications to date are that results of the 5% dust treatment are as satisfactory as were those previously secured with 10% dust.

PUERTO RICO

A newly modified BT-13 plane was used to spray the area of Ensenada, (Ft. Bundy) Puerto Rico, during May, and results were highly satisfactory. The spraying was done for the control of *Anopheles albimanus* and also to determine the applicability of certain modifications of the technical equipment attached to the plane. In this connection, it was noted that the length of the exhaust influenced the particle size — the shorter tube being best for adult kill.

Major drainage malaria control activities of the CDC in the Ensenada area in cooperation with the Insular Health Department ended on May 31, 1947, and employment of all USPHS personnel was terminated. The project had been in operation for approximately 2 years, during which time all significant breeding areas within the 2-mile zone of the city were drained to control the *albimanus* mosquito. The few jobs remaining will be handled by the Insular Health Department during the 1948 fiscal year.

ARKANSAS

FIRST SPRAYING COMPLETED IN THIRTEEN AREAS

According to a report in the ARKANSAS MALARIA BULLETIN, a total of 88,371 houses in Arkansas were treated in the period March 3 through June 28. The first spraying was completed in 13 counties and 4,385 houses were sprayed by crews beginning their second trip through their territories. The first spraying was expected to be completed in all areas by the middle of July.

The following areas, all in District I and II, began the second spraying by June 28, 1947:

District I	District II
Area 11 — Jackson	Area 9 — Phillips
Area 12 — Poinsett	Area 13 — Arkansas
Area 26 — Lawrence	Area 23 — Lee
Area 27 — Randolph	Area 24 — Monroe
Area 28 — Clay	Area 31 — Prairie
Area 29 — Greene	
Area 30 — Craighead	
Area 32 — Independence	

PERSONNEL CHANGES

Engineer (R) Earlie B. Needham has been assigned to the State Office and will assist Mr. Taylor in field contact. A former Arkansas District 2 supervisor, Mr. Needham, has recently been stationed in El Paso, Texas with the Pan-American Sanitary Bureau.

George R. Hays, U. S. Public Health Service entomologist recently returned from an assignment to a malaria control program in Jamaica, has been named district entomologist in Arkansas District 2.

Jack Burkhart, area supervisor in Arkansas County has been forced to resign his position because of illness resulting from injuries received in the war.

—*Arkansas Malaria Bulletin.*

DDT AIRPLANE TREATMENT BEING USED IN FLOODED AREAS

Flood waters of the Mississippi created new and extensive breeding areas in West

Memphis and Helena which sent station counts in recent weeks into the "out of control" range. The same condition was produced in the Marianna zone by back-up water of the L'Anguille River. All these areas were so extensive and inaccessible that control of them by our regular mist larviciding procedures was impossible.

To take care of this emergency, airplane treatment of these breeding areas with DDT was begun July 1 and preliminary checks indicate that station counts are going down. The work will be continued until flood waters subside. Area being treated is over 1,500 acres. *Arkansas Malaria Bulletin.*

VISITOR FROM TURKEY OBSERVES LARVICIDING

Dr. Ata Unalan of Turkey visited District 2 in June, to observe larvicide programs and study rice field irrigation methods. Dr. Unalan is one of several foreign visitors of the in-service training division in Atlanta.

FLORIDA

The Florida office inaugurated "A News Letter" in April, a mimeographed paper issued monthly by the Division of Entomology, the Florida State Board of Health and CDC activities.

Personal and technical items are used and the paper has progressed successfully through four editions.

DDT DUSTING IN PASS-A-GRILLE BEACH

According to the Florida "News Letter," the Mayor and Commissioners of the town of Pass-A-Grille Beach, (Pinellas County), voted to appropriate $500.00 to participate in the operation of a DDT Dusting Program. Approximately 356 residences and 32 business places within the corporate limits will be dusted.

TENNESSEE

The State of Tennessee has initiated a "premise" spraying program this season, similar to that carried on by the Tennessee Valley Authority. All buildings occupied by humans and animals after nightfall are given one residual treatment per season. This differs from the practice as carried on in other states of spraying only residences and privies. Tennessee is also utilizing a one-man crew, which apparently is proving to be effective as evidenced by the man-hours per house reported which compares favorably with the man-hours per house expended by other states, and the Tennessee average is among the lowest in man-hours expended per pound of DDT.

DISTRICT 8

The CDC representative in District 8 has been working closely with the Fish and Wildlife Service on the rodent control problem of states in the District. In this connection, he has rendered valuable service to a number of communities in making recommendations for correction of the improper garbage disposal methods now in use.

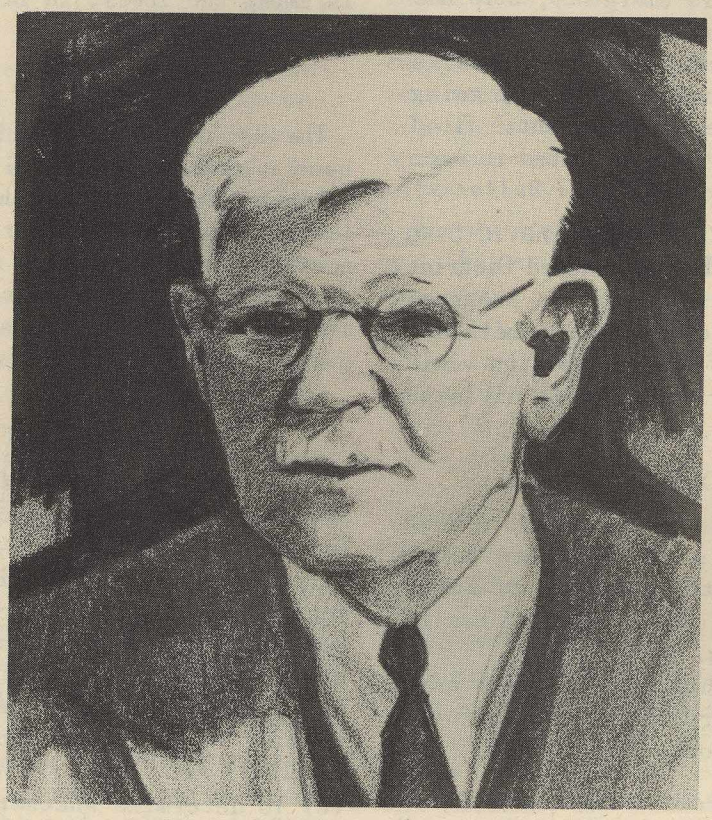
DISTRICT 1

A cooperative rickettsialpox survey in New York City is being undertaken by CDC District representatives in the District I office and the New York City Health Department. The purpose of the project is: (a) To determine to what extent mice from selected areas over the entire city of New York are infected with rickettsialpox. (b) To determine whether other rodent hosts, particularly rats, are involved in the disease. (c) To determine whether there are other vectors of the disease in addition to the mite *Allodermanyssus sanguineus.* (d) From the data obtained in (a), (b), and (c), to attempt to predict the possibilities of the further spread of rickettsialpox in New York City and surrounding areas, and to recommend control measures.

KENTUCKY

The Kentucky State Department of Health has had a considerable increase in reported typhus cases during the past year and recommendations for control measures were furnished by the Typhus Branch. It is possible that certain areas in Kentucky will be eligible for CDC participation in typhus control work during fiscal year 1948.

BOOK REVIEW



DR. MARSHALL A. BARBER

MALARIOLOGIST IN MANY LANDS by Marshall A. Barber. University of Kansas Press, pp. 158, Cloth. Price $2.50.

Although this attractive little book describing Dr. Barber's work on malaria over the world is somewhat anecdotal, the reader gains valuable lessons in the epidemiology and control of malaria. The volume will be well received by those familiar with the author's scientific contributions, and it will be extremely interesting to anyone concerned with malaria.

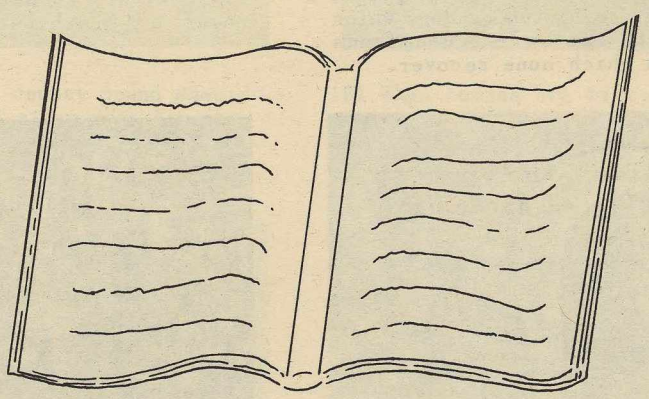
"Malariologist in Many Lands" is not an autobiography. Dr. Barber's role in the story is as an observer and secondary participant; malaria is the central character, and the disease and affected people are always the primary themes. With characteristic modesty, Dr. Barber either subordinates or fails to mention his own contributions. Accounts of contacts with natives in various countries provide an interesting illumination of the author's sympathetic and considerate nature. For instance, at one place in Egypt, children were asked to recite texts of the Koran so that their minds would be diverted and a satisfactory spleen examination could be made. Dr. Barber wonders "if this was the first time that Islamism was invoked to help diagnose splenomegaly."

Throughout the book the author makes observations on general health conditions, and with wistful conjectures calls attention to what could be accomplished with the application of elementary sanitary measures. Commenting on the hopeless condition of the "withered babies" emaciated by dysentery, he writes, "How these people would benefit by a little knowledge regarding the value to their babies of the proper food and clean surroundings!"

A digression from malaria is made at one point to describe in simple terms the basic principles of epidemic investigation. Without presuming to present this information, a painless presentation of epidemiological technics is given in an interesting account of a milk-borne staphylococcus epidemic on a Philippine plantation.

Chapters of the book are arranged essentially in chronological order. Dr. Barber describes his experiences on several continents. He discusses with sincerity and authority work in Central America and the West Indies, the Philippines, Malaya and the Fiji Islands, Africa, Greece, Macedonia, Cyprus and Turkey, Russia, Egypt, India, and Brazil, as well as the United States. He also gives attention throughout the book to the natural history of the mosquito vectors, and presents basic parasitological and entomological material to enable an understanding of malaria transmission and methods of malaria control.

Dr. Barber continues to reiterate his belief that popular education will do much to rid the world of malaria. In the final chapter he states, "We need not be discouraged if it requires a generation or two among some people to accomplish much education, and a good way to begin it is to utilize the natural curiosity of children. In our field work, we often saw children crowding around to watch what was to them a curious sight — a stranger armed with a pail and dipper, scooping up mosquito wrigglers, perhaps in their very dooryards. If the stranger tells them that he is catching mosquitoes which carry their fever, they may not believe nor may their parents, whom they tell about the odd things they have seen. But the next generation of children and parents may be more inclined to listen."



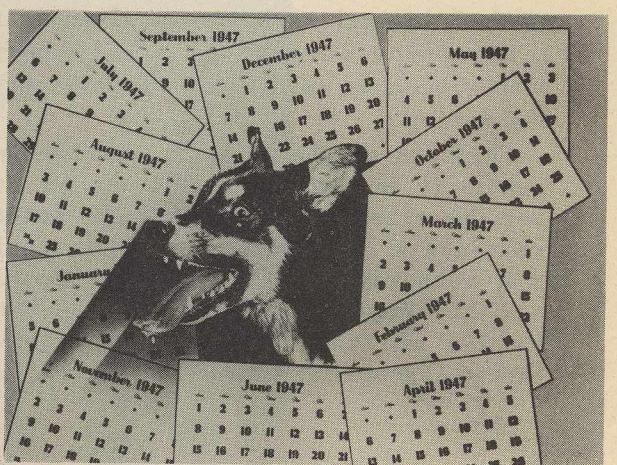
PICTORIAL REVIEW - CDC MOTION PICTURE:

"ERADICATION OF RABIES"

MAD DOG! HYDROPHOBIA — RABIES

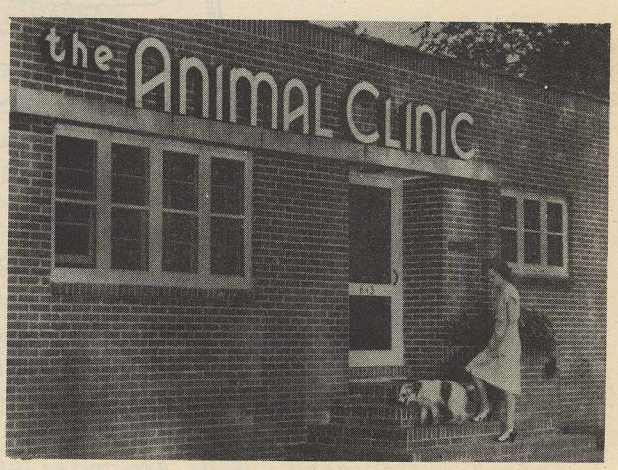
Rabies has been on the increase in the United States for the past 200 years. This 35mm sound film strip explains the program for eradication of the disease.

(1) Every year almost one-half million people in the United States are bitten by dogs which may infect them with rabies — a dangerous deadly disease from which none recover.



(2) Contrary to popular belief, rabies may occur any month throughout the year.

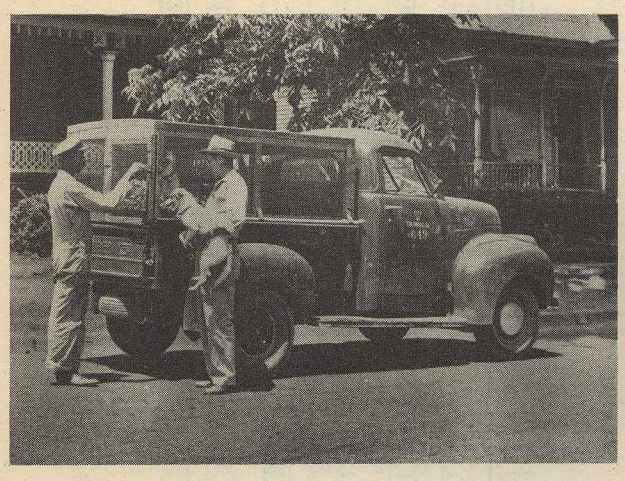
(3) The question is, what can we do to combat this disease in our community and country?



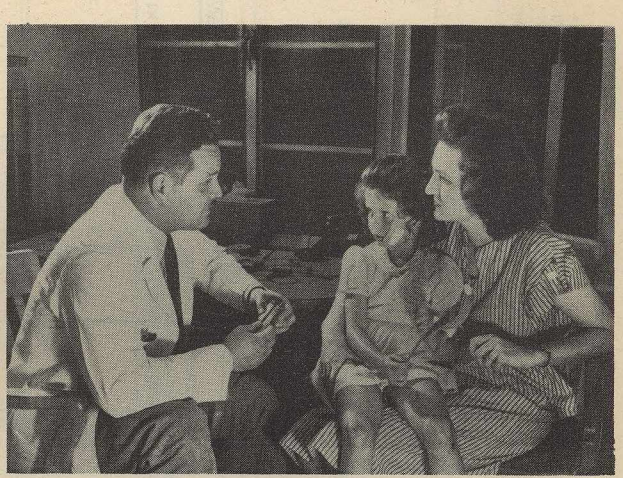
(4) We must take our dogs to a veterinarian or authorized animal clinic for an anti-rabies vaccination at least once a year.

(5) Keep our dogs on leashes or confined at home for thirty days after vaccination, since the vaccine will not be fully effective until the end of that period.

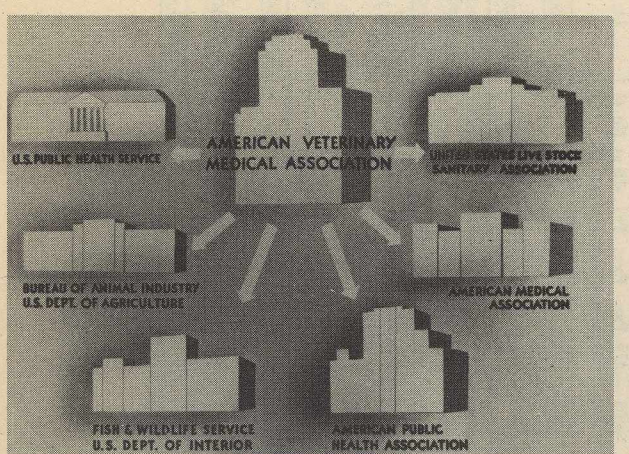
(6) Report the presence of all stray or unknown dogs to your health department.



(7) The dog warden of the county pound should be notified to pick up all stray dogs for they are a potential source of rabies.



(8) When humans are bitten by dogs suspected of having rabies, vaccine treatment has to be continued daily for a period of fourteen to twenty days.



(9) LEFT. The American Veterinary Association will need the cooperation of all these institutions if the program is to succeed.

Production Number: 5-093.0
Running Time: 15 minutes,
87 frames

To obtain this film, address request to:

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

FEDERAL SECURITY AGENCY

COMMUNICABLE DISEASE CENTER
FISCAL BRANCH

U. S. PUBLIC HEALTH SERVICE

CUMULATIVE OBLIGATIONS INCURRED — BY OBJECT (F. Y. 1948)
AS OF JULY 31, 1947

	01	02	03	04	05	07			08	09	13	
						OTHER CONTRACTUAL SERVICES						
	PERSONAL SERVICES	TRAVEL & PER DIEM	TRANS. OF THINGS	COMMUNI-CATION SERVICES	RENT & UTILITY SERVICES	REPAIRS	STOR. & CARE OF VEHICLES	MISC.	SUPPLIES & MATERIAL	EQUIPMENT	REFUNDS, AWARDS, ETC.	TOTAL
7580343.001 - C.C.D.												
Control of Malaria & D. T. O.												
A - 4403(002) - Pur. of Automobiles												
A - 4404 - Salaries-District No. 1												
A - 4405 - Salaries-District No. 2												
A - 4406 - Salaries-District No. 3												
A - 4407 - Salaries-District No. 4												
A - 4409 - All Exp. Exc. Tvl.-Dist.No.6	14.40	12.00										26.40
A - 4410 - Salaries-District No. 7												
A - 4411 - Salaries-District No. 8												
A - 4412 - Salaries-District No. 9												
A - 4413 - All Exp.Exc.Tvl.-Atlanta	179,855.75		8,000.00	227.95	1,353.38	3,577.62	268.00	1,276.95	29,843.95	1,095.66	97.50	225,596.76
Total	179,870.15	12.00	8,000.00	227.95	1,353.38	3,577.62	268.00	1,276.95	29,843.95	1,095.66	97.50	225,623.16
Operation of CDC												
A - 4416 - All Exp.Exc.Tvl.	94,768.25		1,039.25	887.91	8,329.43	77.63	78.00	2,736.77	10,055.24	3,680.68		121,653.16
A - 4417(002) - Pur. of Automobiles												
Total	94,768.25		1,039.25	887.91	8,329.43	77.63	78.00	2,736.77	10,055.24	3,680.68		121,653.16
Murine Typhus Fever Control												
A - 4418 - All Exp. Exc.Tvl.	51,879.00		1,000.00	30.50	40.00	1,154.63	6.00	40.52	3,558.57	489.81		58,199.03
A - 4419(002) - Pur. of Automobiles												
A - 4420 - All Exp.Exc.Tvl.-Hawaii												
Total	51,879.00		1,000.00	30.50	40.00	1,154.63	6.00	40.52	3,558.57	489.81		58,199.03
Virus Disease Invest. & Control												
A - 4421 - All Exp.Exc.Tvl.	21,261.00		800.00	24.25	70.00	222.56		110.20	1,551.08	267.56		24,306.65
A - 4422(002)- Pur. of Automobiles												
Total	21,261.00		800.00	24.25	70.00	222.56		110.20	1,551.08	267.56		24,306.65

(Continued on next page .... below)

CUMULATIVE OBLIGATIONS INCURRED (Continued)

Diarrheal Disease Invest. & Control												
A - 4423 - All Exp. Exc. Tvl.	7,334.00		100.00	85.00	16.00	41.64		1.00	4,435.47			12,013.11
A - 4424(002) - Pur. of Automobiles												
Total	7,334.00		100.00	85.00	16.00	41.64		1.00	4,435.47			12,013.11
Laboratory Technological Services												
A - 4425 - All Exp.Exc.Tvl.	6,265.00		100.00	7.50								6,372.50
A - 4426(002) - Pur. of Automobiles												
Total	6,265.00		100.00	7.50								6,372.50
Plague Control												
A - 4427 - All Exp. Exc. Tvl.	3,000.00		100.00						100.00			3,200.00
A - 4428(002) - Pur. of Automobiles												
Total	3,000.00		100.00						100.00			3,200.00
Total Appropriation 7580343.001	364,377.40	12.00	11,139.25	1,263.11	9,808.81	5,074.08	352.00	4,165.44	49,544.31	5,533.71	97.50	451,367.61
7580342.002 - Assistance to States, Gen.												
A - 3955 - Salaries	5,156.00											5,156.00
A - 3956 - Misc. Exp. Exc. Tvl.			100.00	21.00			10.00		86.12			217.12
Total Appropriation 7580342.002	5,156.00		100.00	21.00			10.00		86.12			5,373.12
7580340 - Control of Tuberculosis												
A - 3649 - Salaries												
A - 3650 - Misc. Exp. Exc. Tvl.				7.50					411.33	371.74		790.57
Total Appropriation 7580340				7.50					411.33	371.74		790.57
7580110(03) - Traveling Expenses, F.S.A.												
Direct CDC Travel Allotments												
A - 3148 - Training		498.00										498.00
A - 3161 - Operation of CDC		5,720.40										5,720.40
A - 3162 - Control of Malaria & D.T.O.		6,196.75										6,196.75
A - 3164 - Murine Typhus Fever Control		2,323.00										2,323.00
A - 3165 - Virus Disease Invest. & Cont.		3,180.00										3,180.00
A - 3166 - Diarrheal Dis. Invest. & Cont.		150.00										150.00
A - 3167 - Lab. Technological Services		250.00										250.00
A - 3169 - Plague Control - Atlanta		80.00										80.00
Total		18,398.15										18,398.15
Increases to Districts or Other Division Allotments from CDC Travel Apportionments												
A - 3152 - Travel Expenses - Dist. No. 2												
A - 3153 - Travel Expenses - Dist. No. 3												
A - 3154 - Travel Expenses - Dist. No. 4												
A - 3157 - Travel Expenses - Dist. No. 7												
A - 3163 - Travel Expenses - Dist. No. 6		130.80										130.80
Total		130.80										130.80
Total Appropriation 7580110(03)		18,528.95										18,528.95
Grand Total - All Appropriations	369,533.40	18,540.95	11,239.25	1,291.61	9,808.81	5,074.08	362.00	4,165.44	50,041.76	5,905.45	97.50	476,060.25

PERSONAL SERVICES EXPENDITURES FOR CDC ACTIVITIES

June, 1947

ALLOCATION UNIT AND SYMBOL		COMMISSIONED PERSONNEL	PROF. & SCIENTIFIC	SUB-PROFESSIONAL	C. A. F.	CUSTODIAL	TEMPORARY	TOTAL
Alabama	01	$ 1,074.00	$ 270.96	$ 4,611.59	$ 673.98	$ 3,446.06	$ 14,039.02	$ 24,115.61
Arkansas	03	846.60	3,117.85	17,814.10	5,197.34	2,992.04	--	29,967.93
California	04	236.55	---	445.44	433.88	---	834.82	1,950.69
Florida	09	747.00	1,644.20	2,887.00	1,235.16	343.83	5,170.51	12,027.70
Georgia	10	1,389.75	2,108.96	6,706.77	1,651.48	385.66	17,060.47	29,303.09
Kentucky	16	373.50	623.92	169.67	195.72	---	1,183.12	2,545.93
Louisiana	17	640.90	826.92	987.36	1,721.50	941.44	6,202.99	11,321.11
Mississippi	23	956.20	338.48	2,368.14	1,249.56	213.08	15,902.34	21,027.80
Missouri	24	---	599.80	629.60	1,051.90	207.30	5,460.62	7,949.22
North Carolina	32	373.50	1,120.70	1,353.04	804.08	251.66	2,571.74	6,474.72
Oklahoma	35	713.42	---	1,219.33	882.24	---	835.97	3,650.96
South Carolina	39	327.00	1,721.81	9,439.00	1,745.34	982.48	2,999.25	17,214.88
Tennessee	41	735.50	1,034.74	2,672.78	1,031.35	523.50	5,363.76	11,361.63
Texas	42	2,674.75	965.92	12,226.22	3,114.90	697.66	17,614.15	37,293.60
Virginia	45	---	415.66	464.74	213.08	709.40	1,384.01	3,186.89
Puerto Rico	50	1,331.23	338.70	2,404.44	1,831.50	6,957.18	3,239.02	16,102.07
Other States & Div.	76	2,245.10	413.52	---	176.91	---	210.91	3,046.44
Laboratories, Training, and Other Direct Activities Conducted by CDC Headquarters (including Administrative and Executive Costs)		19,424.46	8,508.90	9,818.44	42,598.82	5,645.74	48,363.55	134,359.91
Total		$34,089.46	$24,051.04	$76,217.66	$65,808.74	$24,297.03	$148,436.25	$372,900.18

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