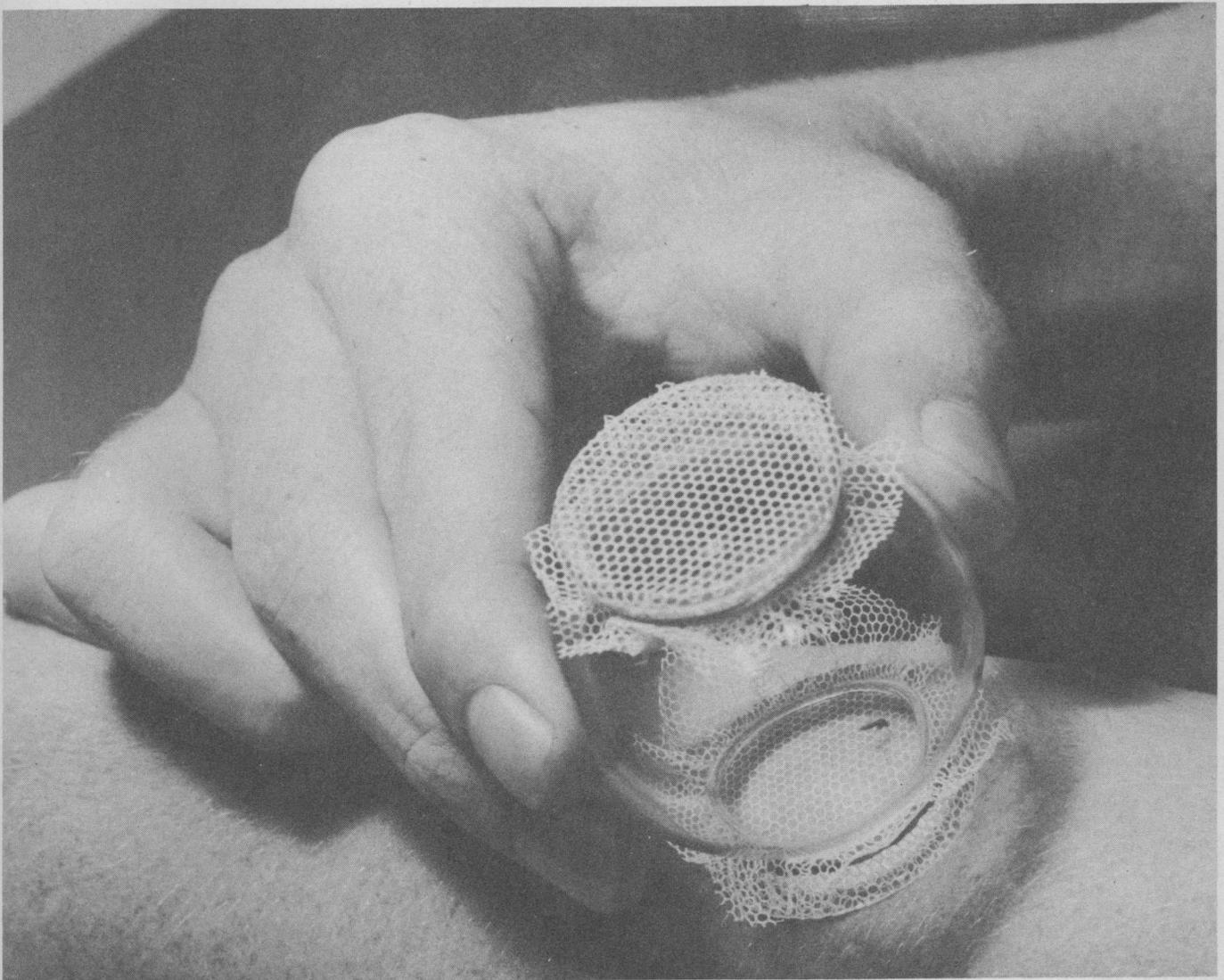


# MONTHLY REPORT

FEBRUARY , 1944

OFFICE OF  
MALARIA CONTROL IN WAR AREAS  
ATLANTA , GEORGIA



## SPECIAL REPORTS:

"Imported Malaria Studies" By Martin D. Young , Sanitarian (R)

"Malaria Control Mobile Units" By Chris A. Hansen, P.A. Sanitary Engineer (R)



FEDERAL SECURITY AGENCY U.S. PUBLIC HEALTH SERVICE

From the holdings of the National Archives at Atlanta

TABLE I

## MCWA LARVICIDE AND MINOR DRAINAGE PROJECTS

FEBRUARY 1 - 29, 1944

STATE	Areas in Operation	War Establishments Protected	LARVICIDAL WORK					OTHER WORK					Total Man Hours	Average Men Employed
			Larvicide Used		Surfaces Treated Acres	Ditching		Cleaning Lin.Ft.	Clearing Acres	Water Surf. Eliminated Acres				
			Oil Gals.	Paris Green Lbs.		Cu.Yds.	Lin.Ft.							
Alabama	5	73	---	---	---	1,584	3,290	10,930	3.8	1.9	4,806	35		
Arkansas	6	70	---	---	---	983	13,105	23,590	14.6	15.8	9,576	54		
California	4	29	31	---	2.0	2,193	13,556	88,387	7.3	35.8	4,840	26		
D. C.	1	25	---	---	---	449	3,879	2,426	0.8	---	2,160	11		
Florida	17	141	---	---	---	9,547	65,866	135,572	22.4	194.3	32,907	183		
Georgia	12	101	---	28	22.4	1,648	12,560	87,664	28.8	18.5	22,493	126		
Illinois*	1	56	---	---	---	---	---	1,695	---	---	792	4		
Kentucky	2	45	---	---	---	---	---	6,012	---	---	909	5		
Louisiana	8	68	1,964	---	103.7	10,185	119,340	255,689	61.2	56.0	59,140	321		
Maryland	1	29	---	---	---	786	2,460	4,800	1.8	---	2,624	17		
Mississippi	5	55	---	---	---	360	7,675	49,983	35.8	3.6	11,262	66		
Missouri	3	34	---	---	---	41	430	4,500	0.6	---	1,472	9		
North Carolina	8	72	---	---	---	1,501	19,806	166,837	17.5	19.7	14,781	79		
Oklahoma*	1	38	---	---	---	---	---	---	---	---	1,440	8		
Puerto Rico	4	19	180	5,360	789.8	904	19,149	87,267	30.1	0.4	57,402	386		
South Carolina	8	111	---	---	---	826	9,115	55,524	12.4	8.3	11,316	77		
Tennessee	2	69	---	---	---	623	5,941	22,825	11.9	4.2	6,192	39		
Texas	13	164	1,496	31	92.7	4,376	37,207	309,328	61.6	52.7	33,317	240		
Virginia	4	99	---	---	---	6,383	68,142	18,800	2.6	---	20,158	134		
Total	105	1,298	3,671	5,419	1,010.6	42,389	401,521	1,331,829	313.2	411.2	297,587	1,820		
January Total	99	1,298	7,870	4,524	6,539.5	37,952	345,345	1,246,580	225.9	232.5	243,084	1,681		

\* Reconnaissance Surveys, mapping, Etc.

TABLE II

## MCWA MAJOR DRAINAGE PROJECTS

FEBRUARY 1 - 29, 1944

STATE	No. of Projects	Clearing Brushing Acres	Channel or Ditch Cleaning Lin.Ft.	New Ditching			Total Cu.Yds.	Fill Cu.Yds.	Ditch Lining Placed		Underground Drains Lin.Ft.	Water Surf. Eliminated Acres	Total Man Hours
				Hand	Lin.Ft. Mach.	Dynamite			Sq.Ft.	Lin.Ft.			
Alabama	2	---	700	60	---	7,700	4,320	---	---	---	---	20.0	1,294
Arkansas	3	0.5	1,375	810	2,400	5,375	2,890	---	---	---	561	0.6	1,118
Florida	3	5.0	15,425	---	---	2,200	3,276	---	---	---	---	500.0	3,795
Indiana	1	0.3	---	---	---	---	---	---	---	---	---	---	402
Kentucky	2	---	---	1,200	---	---	339	---	---	---	---	---	1,369
Louisiana	1	2.1	---	---	---	---	---	---	---	---	---	---	760
Mississippi	2	---	900	550	---	---	170	64	3,563	887	---	0.2	4,250
North Carolina	9	17.2	34,335	28,252	990	4,403	8,679	2,129	---	---	---	96.3	18,024
Oklahoma	1	---	---	1,920	---	---	507	275	---	---	1,930	10.0	2,164
Puerto Rico	2	0.1	500	300	---	---	759	---	---	---	---	---	16,915
South Carolina	13	16.2	17,664	21,134	2,030	21,900	23,778	337	---	---	300	25.7	37,112
Tennessee	2	---	---	243	---	---	51	148	1,900	500	243	---	2,084
Texas	6	4.4	2,000	10,530	---	---	2,078	412	1,460	350	---	16.0	8,160
Virginia	1	1.0	---	---	---	5,190	2,831	---	---	---	---	---	204
Total	48	46.8	72,919	64,999	5,420	46,768	49,678	3,365	6,923	1,737	3,034	668.8	97,951
January Total	49	58.7	203,002	61,713	9,771	25,226	42,424	4,130	5,965	1,803	1,840	179.5	116,079

TABLE III

## MCWA PERSONNEL ON DUTY ON FEBRUARY 29, 1944 AND TOTAL PAYROLL FOR MONTH OF FEBRUARY

FEBRUARY 1 - 29, 1944

STATE	Commissioned		Prof. & Sci.		Sub-Prof. (1)		C. A. P.		Custodial		Total		Percent of Total	
	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay
Alabama	5	1,376	1	264	2	365	2	410	37	410	47	4,782	1.5	1.8
Arkansas	6	1,710	3	952	20	3,814	5	1,002	45	6,070	79	13,548	2.6	3.3
California	2	565	---	---	7	1,277	2	467	21	3,231	32	5,540	1.1	1.4
D. C.	1	331	1	319	3	598	2	595	7	980	14	2,823	0.4	0.7
Florida	5	1,739	6	1,667	16	3,306	5	880	202	25,186	234	32,778	7.8	8.1
Georgia	8	2,865	3	906	33	5,986	5	793	92	12,213	141	22,763	4.7	5.6
Illinois	3	860	2	441	---	117	1	152	2	277	8	1,847	0.3	0.5
Indiana	3	1,097	---	---	---	---	---	---	6	795	9	1,892	0.3	0.5
Kentucky	2	565	3	527	2	559	1	164	10	1,416	18	3,231	0.6	0.8
Louisiana	10	3,078	6	1,853	42	7,963	5	915	300	38,658	363	52,467	12.1	13.0
Maryland	1	247	---	---	4	750	2	410	14	1,794	21	3,201	0.7	0.8
Mississippi	5	1,710	2	264	8	1,723	3	556	82	9,552	100	13,805	3.3	3.4
Missouri	2	565	---	35	13	2,462	1	152	6	868	22	4,082	0.7	1.0
North Carolina	6	1,702	6	1,925	10	1,993	3	574	201	24,173	226	30,367	7.5	7.5
Oklahoma	2	573	2	583	7	1,413	1	446	11	1,486	23	4,201	0.8	1.0
Puerto Rico	8	3,107	1	440	8	2,956	5	1,605	564	24,303	586	32,411	19.4	8.0
South Carolina	5	1,758	5	1,297	23	4,923	3	592	288	34,685	324	43,455	10.8	10.7
Tennessee	4	1,129	2	477	6	1,429	2	438	18	5,727	62	9,200	2.1	2.3
Texas	8	2,271	5	1,534	25	5,495	5	850	212	26,352	255	36,502	8.5	9.0
Virginia	3	847	2	688	11	2,238	2	428	127	15,599	145	19,800	4.8	4.9
<u>AEDES AEGYPTI</u>														
Florida	1	142	---	---	26	4,749	1	322	1	76	29	5,289	0.9	1.3
Georgia	1	282	---	---	11	1,818	2	329	1	90	15	2,519	0.5	0.6
Louisiana	1	532	1	264	18	3,192	1	446	---	---	21	4,134	0.7	1.0
South Carolina	1	282	---	---	11	2,014	1	164	1	125	14	2,585	0.5	0.6
Texas	4	1,129	2	487	18	3,456	1	446	10	1,434	35	6,652	1.2	1.7
H.Q. & Dist. (2)	64	20,734	8	2,093	16	3,065	91	15,649	8	953	187	42,494	6.2	10.5
Total	161	51,196	61	17,016	340	67,661	152	27,885	2,296	241,025	3,010	404,783	100.0	100.0
Percent of Total	5.3	12.6	2.0	4.2	11.3	16.7	5.1	6.9	76.3	59.6	100.0	100.0		

(1) Includes Entomological Inspectors

(2) Includes Headquarters and District Offices, malaria survey, imported malaria control, special investigations and employees temporarily attached to Headquarters pending assignment to states.

# MALARIA CONTROL IN WAR AREAS

*Monthly Report for February 1944*

## IMPORTED MALARIA STUDIES

By Martin D. Young, Sanitarian (R)  
Officer in Charge, Imported Malaria Studies  
U. S. Public Health Service

To study the public health significance of the malarias brought into this country by troops returning from malarious areas, the Army and the Public Health Service have begun a cooperative project to be called "Imported Malaria Studies." Principal objectives of the program are: (1) to determine the ability of the imported malarias to infect American anophelines and to be transmitted by them; (2) to gather information on the parasitology and other characteristics, and to distinguish, if possible, between strains; (3) to evaluate the findings and to suggest their implications upon control measures.

The divisions of the Public Health Service which are cooperating are the Office of Malaria Control in War Areas and the National Institute of Health. The Office of Malaria Control in War Areas has made available funds for carrying on the work, and supplies all the personnel with the exception of the Officer in Charge. The National Institute of Health furnishes the Officer in Charge and is responsible for the direction of the investigation.

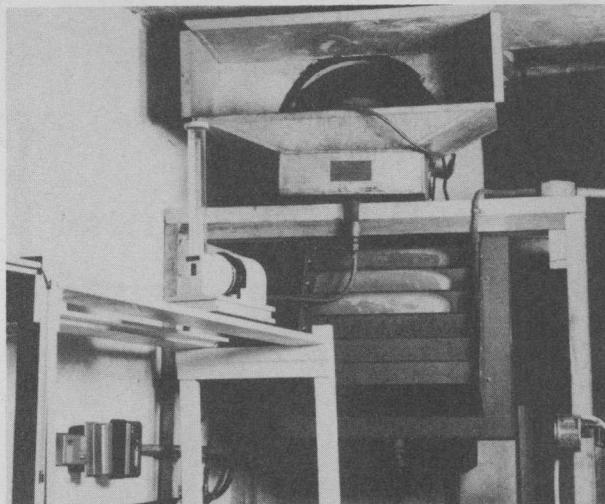
The Army makes available troops relapsing with imported malaria and has provided space for two laboratories. The headquarters laboratory is located in the National Institute of Health Malaria Research Laboratory at Columbia, S. C. where the regular personnel and equipment of the Institute are used when needed. This laboratory has access to patients at four Army hospitals: Moore General, Asheville, North Carolina; Oliver General, Augusta, Georgia; Stark General, Charleston, South Carolina; Fort Jackson, Columbia, South Carolina; and to the Navy Hospital at the Charleston Navy Yard.

A second laboratory, provided by the Army, is in operation at Letterman General Hospital, San Francisco, California, and a third is now being organized at Harmon General Hospital, Longview, Texas. At each laboratory an insectary is maintained, with *Anopheles quadrimaculatus* Say or *Anopheles freeborni* Aitken as the standard testing species. Other desirable species are to be tested when they are available.

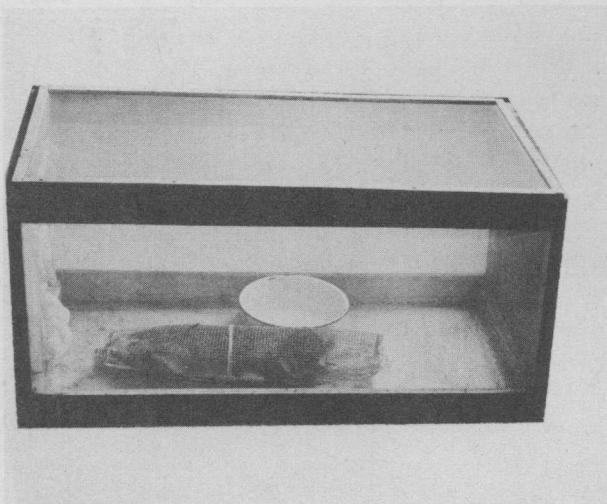
The principal procedures involved in the work are those which have been developed during the past few years in the Columbia laboratory. In general, when a relapsing malaria patient shows sufficient numbers of gametocytes, mosquitoes (preferably about 200) are applied. Then they are dissected at proper intervals to determine infections of the stomach and salivary glands. As many of the stains as possible will be further tested by attempting transmission to another human host. Highlights of the process are pictured with brief explanatory notes on the following pages.



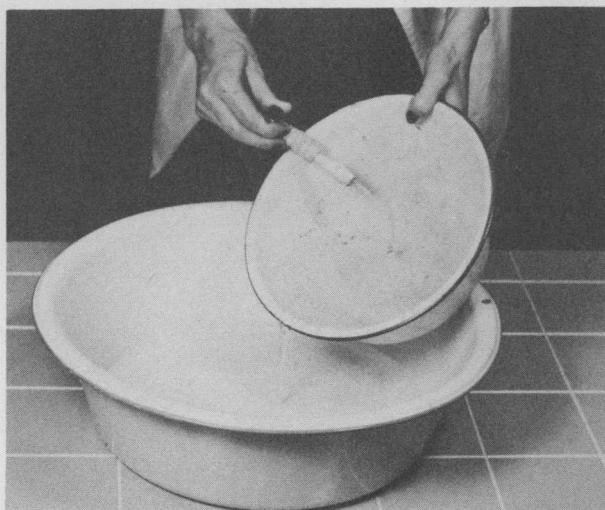
1. Experiments involving transmission of malaria require a constant, plentiful supply of mosquitoes. This is no simple task.



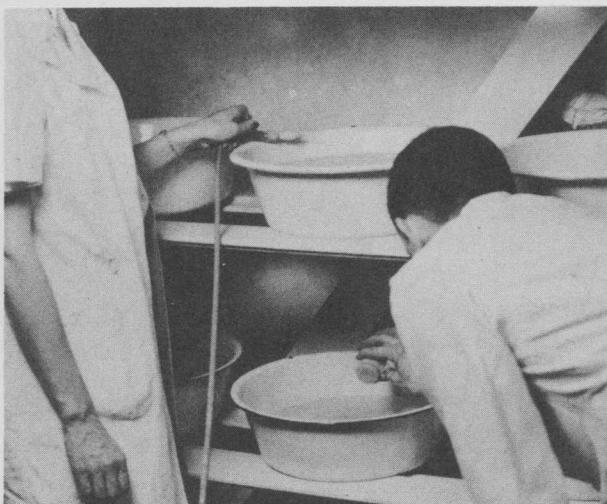
2. For *Anopheles quadrimaculatus*, temperature of 75° - 80° F. and 80% relative humidity are strictly maintained by special equipment.



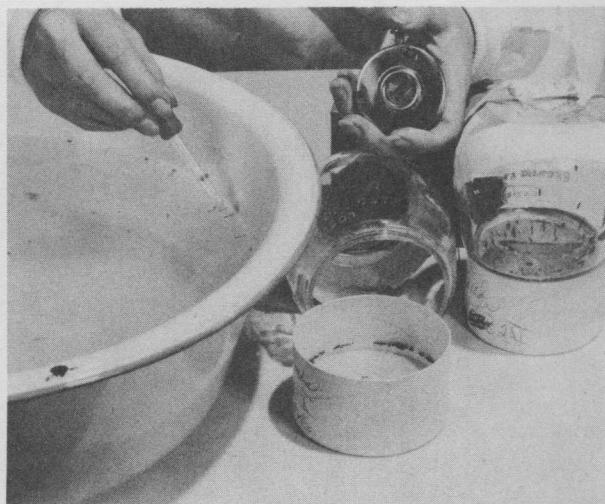
3. Colonies of adults kept in stock cages are fed on rabbits, since blood meals are prerequisite to production of fertile eggs.



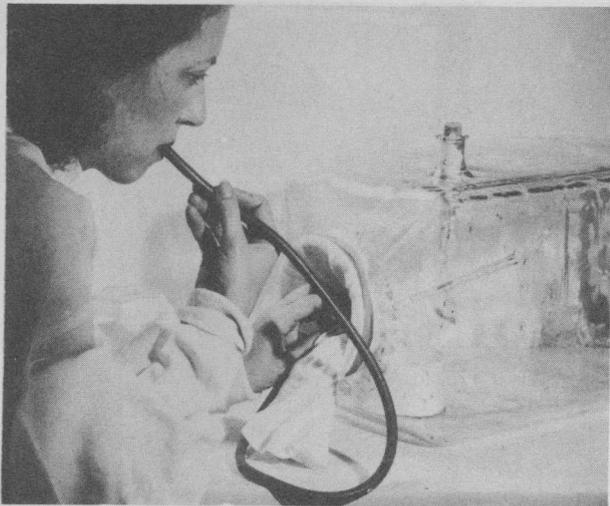
4. Eggs recovered daily from stock cages are carefully washed into developing pans containing cultures of protozoa for food.



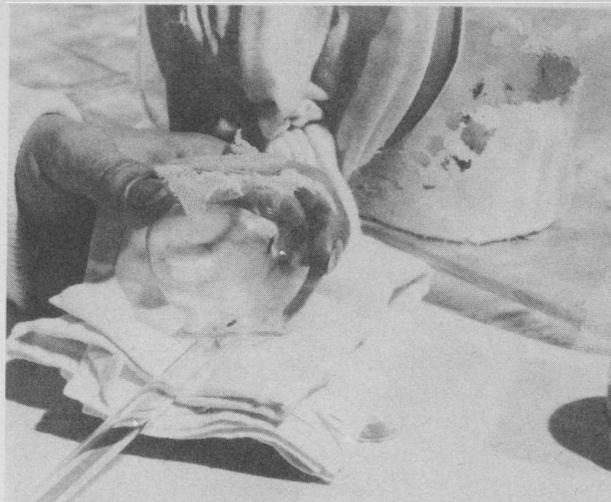
5. Once or twice a day edges of pans are washed clean, and food for larger larvae (here, finely ground dog biscuit) is applied.



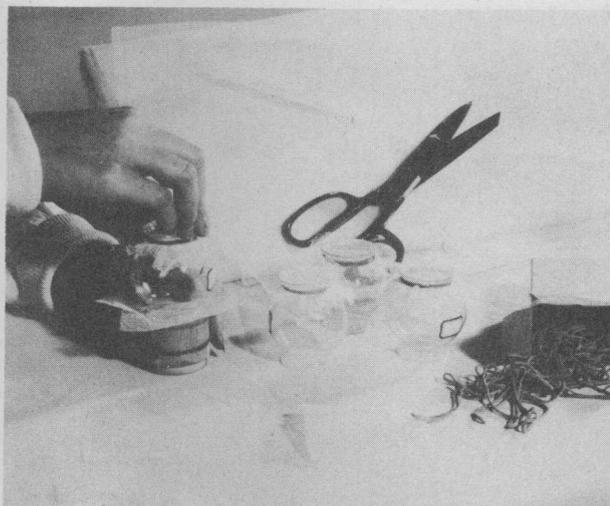
6. In about two weeks, after four moults, larvae become pupae. The pupae are collected daily, counted, and covered to catch emerging adults.



7. Adults are transferred to larger cage for mating. This seems to increase their desire for blood meals. Females are then recovered.



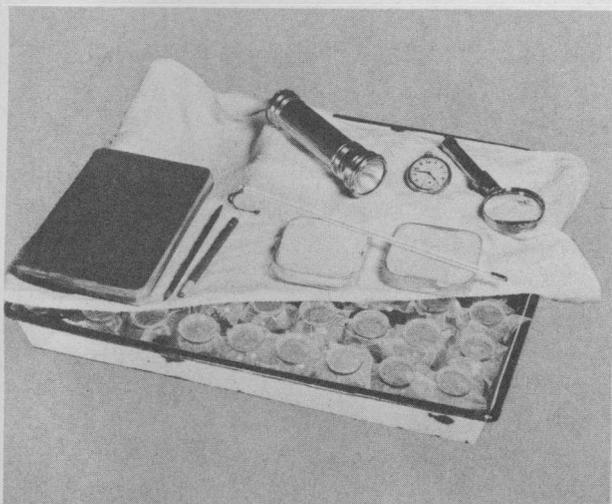
8. Females are placed in individual glass feeding jars. Five can be conveniently handled in each jar. These may be kept for days before use.



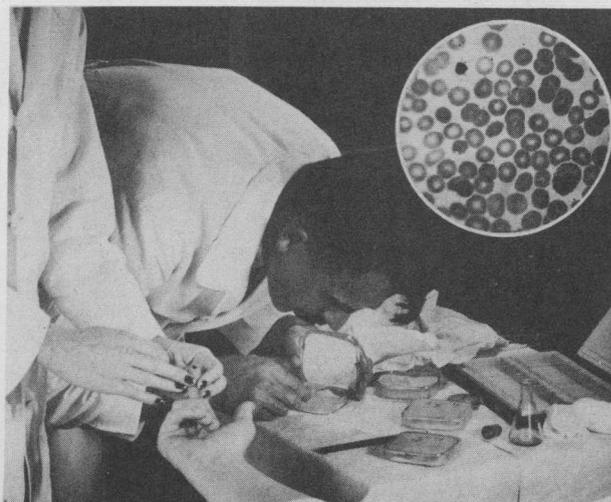
9. Ends of feeding jars are covered with bobbinet. Mosquitoes remain in these jars until taken out for dissection. (A few may die off.)



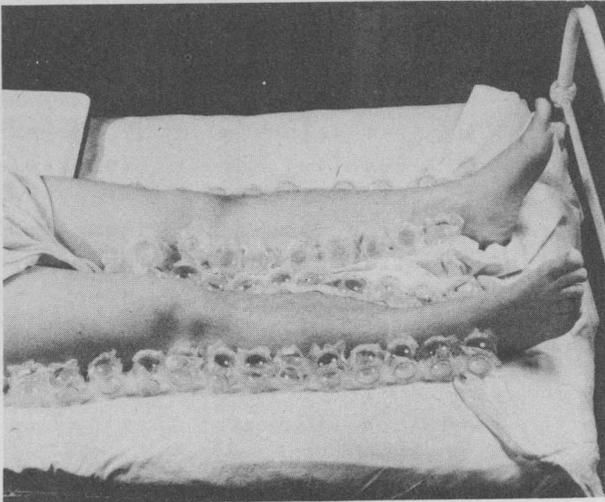
10. Mosquitoes in jars are fed nightly by placing in cellulose cotton wet with Karo-water on top of each jar and removing it the next morning.



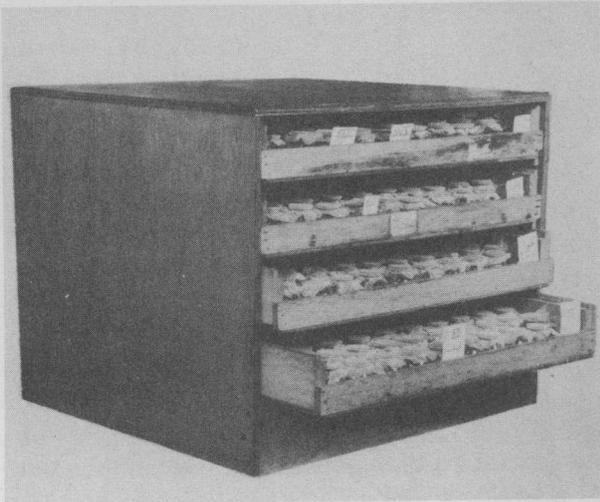
11. Mosquitoes are allowed to feed on patients with malaria, preferably when gametocyte count is high. Equipment used is shown above.



12. Before feeding, slides are made, kept moist for 5, 10, 15, and 20 minutes, stained, and examined for exflagellation of male gametocytes.



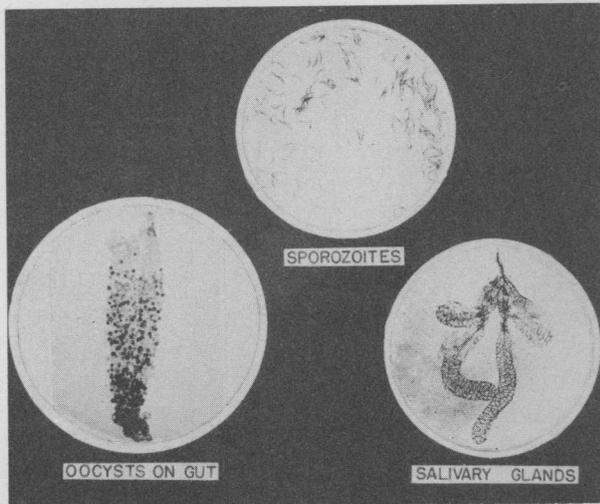
13. Feeding jars of uninfected mosquitoes are placed along legs of patient. Several hundred mosquitoes may be fed in 20 - 40 minutes.



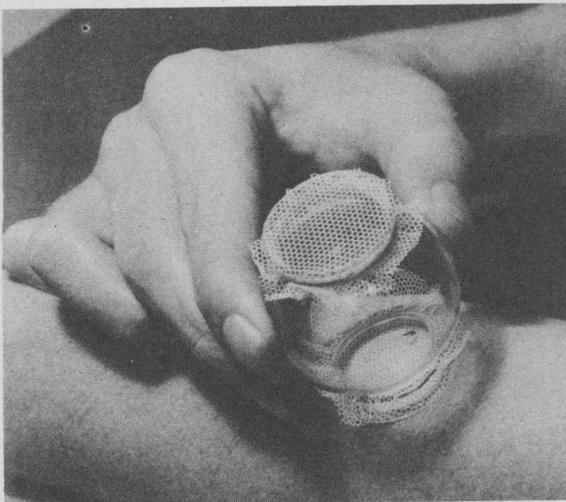
14. Back in insectary, jars of mosquitoes, now potentially infected, are kept in cabinet providing individual space for each jar.



15. Sample mosquitoes are dissected at intervals to determine the percentage of infection. If not infected, transmission is not attempted.



16. Oocysts on stomach are best seen after 7 or 8 days, while sporozoites may be seen from about the 12th or 14th day until mosquito dies.



17. Mosquitoes from lots showing sporozoites are carefully applied, to infect new patients requiring malaria for therapeutic reasons.



18. At the end of the incubation period, smears from these patients may demonstrate presence of parasites, thus proving transmission.

# MALARIA CONTROL MOBILE UNITS

By Chris A. Hansen, P. A. San. Engr. (R)  
Engineering Section (Mobile Units)

One of the most important innovations of the 1944 season will be the use of mobile malaria control units around Army general hospitals and prisoner-of-war camps. These units are designed to conduct entomological inspections and engineering control in order to maintain safe anopheline densities in marginal malarious areas where there is not a sufficiently continuous anopheline hazard to warrant the establishment of a permanent local project. The units will be organized to keep such unprotected areas under constant surveillance, and will be prepared to take action should the density of the vector indicate that control work is necessary. In addition they will furnish an incidental but important means for readily controlling any small explosive epidemics that may occur at scattered points throughout the country.

Each unit consists of a passenger vehicle and a heavy truck containing the supplies, material, and equipment necessary to conduct preliminary surveys, entomological inspections, and larviciding and minor drainage work.

A commissioned officer, either entomologist or engineer, will be in charge of each unit, and will be directly responsible to the District Office of the USPHS District in which the unit operates. Arrangements for the assignment of mobile units to States and specific areas within States will be made by the Public Health Service District and the health officers of the States in which the unit is operating. Similarly, necessary arrangements with Service Command Liaison Officers will be made by the District. The mobile unit as it travels from one military establishment to another will at each location operate under the jurisdiction of the respective State health officer just as if the unit were permanently established at that location.



Malaria control mobile unit

The officer in charge of the unit will hire his assistants and laborers locally. As each unit will have many areas under surveillance or control, all men in the unit will be on travel status, and will spend only a small part of their time at their official headquarters. The time required to cover the areas in a circuit will vary considerably.

The present tentative plans call for the establishment of eight mobile units; two each to be located in USPHS Districts 1 and 5, and one each in Districts 3, 7, 8, and 9. In addition to these, several reserve units will be held at the MCWA headquarters office in Atlanta for emergency use.

The two California units are now in the field, and the remainder will be sent to their assigned stations about April 1. This will allow sufficient time to become acquainted with their areas and to arrange satisfactory schedules before the active control season begins.

## SECTION REPORTS



 The Medical Section continued studies on the epidemiology of malaria. Mortality records were summarized for the period 1935-1939 according to population in a map in the December Monthly Report, for the period 1938-1942 according to area in a map in the January Report, and for the period 1938-1942 according to population on the back cover of the present Report. These data will be combined in a map on the back cover of the next issue to show the endemic foci of malaria.

 The Engineering Section reports excellent progress on all major drainage projects, and a new project, designed to eliminate approximately 900 acres of anopheline breeding area within flight range of the Jackson Barracks Area, New Orleans, Louisiana.

 The Entomology Section has received lists of mosquito distribution and abundance (Manual Letter No. 9) from most of the states. These data, compiled from light trap collections of the 1943 season, will be further elaborated as scientific contributions by each state. Meanwhile, preliminary lists are urgently needed by military authorities because of the danger from such mosquito borne diseases as filariasis and encephalitis.

 The *Aedes aegypti* Section has started two new projects in critical southern cities. Assistant Sanitarian (R) James A. Morrow is area supervisor for the Mobile, Alabama project, and Assistant Sanitarian (R) Bertram Gross is setting up and temporarily supervising the Jacksonville, Florida project.

*Aedes aegypti* education in non-project cities is being handled through the cooperation of the Office of Civilian Defense. Distribution of leaflets will be coordinated with an all-out educational program in each city. Supervisors of several *Aedes aegypti* projects will assist in the campaigns in neighboring cities. Assistant Sanitarian (R) Peter G. Cranford has left for Florida with a mobile educational unit and his itinerary is planned to coincide with O.C.D. leaflet distribution programs.

 The Training and Education Division has completed twelve sets of an elaborate *Aedes aegypti* window display for use in connection with the O.C.D. educational program. Fifteen 24 sheet billboards have also been prepared and shipped to Miami, Florida to be used in the program.

A movie, "Mosquito Proofing for Malaria Control", has just been completed which shows methods of screening, patching holes, and otherwise sealing a house against mosquitoes. Two additional movies are now available for field use. "Malaria: Cause and Control" is a War Department 16mm sound film running 22 minutes. "The Winged Scourge" is a Walt Disney film prepared for the Coordinator of Inter-American Affairs. It is a 16mm sound film in color, running eight minutes.



## HEADQUARTERS NOTES

Additions to the headquarters staff include Sanitary Engineer G. E. McCallum, assistant chief of the Division of Operations; Sanitary Engineer (R) C. E. Schwob, in charge of the *Aedes aegypti* Section; and P. A. Sanitarian (R) R. L. Usinger and Assistant Engineer (R) Gordon R. Christensen assigned to the Division of Inservice Training, Reports and Education. Dr. Usinger heads the Reports Section.

Surgeon (R) William R. Willard, P. A. Surgeon (R) H. K. Abrams, and P. A. Surgeon (R), Reuben F. Reider, have been assigned to the MCWA headquarters office to conduct field surveys to define endemic malaria foci. Prior to assignment to the malaria control program, Dr. Abrams was detailed as health officer in Texarkana, Arkansas, and Dr. Reider was detailed as health officer in Decatur, Illinois. Dr. Willard, who was recently commissioned in the Public Health Service was health officer at Hagerstown, Maryland.

The following recently commissioned officers have been temporarily assigned to the headquarters office for training: Assistant Sanitarian (R) R. H. McCauley, Jr.; Assistant Engineer (R) A. S. Marchese; P. A. Sanitarian (R) L. D. Judkins; Assistant Sanitarian (R) C. W. Sabrosky; and Assistant Sanitarian (R) C. B. Bridges.

New assignments include Assistant Sanitarian (R) Victor Tiship to Baltimore, Maryland; Assistant Sanitarian (R) Deed C. Thurman to Chickasha, Oklahoma; and Assistant Engineer (R) Sheldon L. Lang to a mobile unit assigned to District 1. Transfers of personnel include P. A. Sanitary Engineer (R) Paul C. Henderson from Tampa to Jacksonville, Florida where he will be state MCWA engineer; P. A. Engineer (R) Hershel Engler from Atlanta to District 3 to be district MCWA engineer; Assistant Sanitarian (R) John M. Ellis from Atlanta to Longview, Texas, where he will be assigned to Imported Malaria Studies, USPHS Laboratory, Harmon General Hospital.

A conference on recent developments in the chemical control of mosquitoes was held from March 6 to 9 by the Bureau of Entomology and Plant Quarantine laboratory at Orlando, Florida. The following MCWA representatives were invited to attend: P. A. Sanitary Engineer (R) Chris A. Hansen; P. A. Sanitarian (R) Roy F. Fritz; and P. A. Engineer (R) Francis A. Jacocks. Facts presented at the meeting suggest that a new era is dawning in the control of mosquitoes.

Examinations for commissions in the Regular Corps of the U. S. Public Health Service were held on March 25 at MCWA Headquarters. The Medical Board and the Engineering Board convened at that time.

Reports on War Bond deductions show Indiana, Kentucky, Maryland, and the Florida *aegypti* program with 100 per cent participation and Arkansas, Georgia, Kentucky, Maryland, Missouri, Virginia, and the Georgia and Florida *aegypti* programs with gross monthly deductions of 10 per cent or above. Eighty percent of the MCWA employees are participating in the payroll savings plan and the gross monthly deductions for the entire MCWA program amount to 10 percent of the gross monthly payroll.



## FIELD NOTES

Leesburg, Florida reports a project well under way for the filling of a quad breeding area by means of a hydraulic dredge. This is the first instance in which such equipment has been used in connection with Malaria Control in War Areas.

Field conferences of state MCWA personnel and area supervisors were held in Louisiana, Mississippi and Tennessee during February, with members of the MCWA headquarters Administrative Division attending. Procedures, procurement, supply and personnel needs were discussed, operations were reviewed and plans made for the coming year.

All malaria control areas have received the revised semi-monthly engineering progress report form. This is intended for use beginning April 1, and will be accompanied by suitable daily report forms to facilitate recording of data. The new form combines the old MCWA forms 201A and 202A. The detailed information called for in this new form will be well worth the time and effort of MCWA personnel since it will give complete data on current operations and a sound basis for future projects.

The Savannah, Georgia *Aedes aegypti* project is using a Negro laborer to assist in cleaning up large accumulations of bottles, cans, and similar breeding places, and to create interest in community clean-up projects in the Negro sections of the city. He explains the danger of the situation to people living in neighborhoods where the accumulations of trash are found, and solicits their assistance in the clean-up work. Several lots adjacent to Negro tenements have been cleaned in this way, and re-checks show that no new trash piles are appearing.

Field and headquarters personnel contributed scientific reports to the annual meetings of the California Mosquito Control Association (February 28-29) and the New Jersey Mosquito Extermination Association (March 15-17). At the California meeting P. A. Sanitarian (R) W. C. Frohne read a paper by Assistant Sanitary Engineer H. F. Ludwig, "The *Aedes aegypti* Program of the U. S. Public Health Service"; Assistant Sanitarian (R) G. E. Washburn read a paper by Special Consultant A. C. Chandler of the Rice Institute, Houston, Texas, "Phenothiazine as a Mosquito Larvicide"; A. H. Geib read a paper, "The Work of Malaria Control in War Areas in California"; and Sanitary Engineer (R) Nelson H. Rector read a paper, "The Use of Ditch Linings, Underground Drains, and Sanitary Fills" and participated in a panel discussion on "Mosquito Control Problems" in which questions were submitted from the floor.

At the New Jersey Meetings Sanitarian (R) Herman L. Fellton and Assistant Sanitarian (R) Ralph C. Barnes contributed a paper on "The Plan of Operation for the Special Northeastern Division of the Malaria Control in War Areas Office of the U. S. Public Health Service"; Assistant State Director R. E. Dorer gave the report for Virginia in a symposium on "Methods Employed to Overcome the Effects of Wartime Shortages so that Progress in Mosquito Control Could be Made"; and Senior Entomologist (R) G. H. Bradley and Sanitary Engineer (R) Nelson H. Rector gave the entomological and engineering phases, respectively, of "Malaria Control in the United States in 1943 by the U. S. Public Health Service."



## LITERATURE REVIEW

Middlekauff, W. W. A rapid method for making permanent mounts of mosquito larvae. *Science*, 99:206. 1944.

Capt. Middlekauff has developed a method for mounting mosquito larvae on microscope slides utilizing readily available ingredients. Larvae are killed in hot water to fix the protein in the body and thus prevent discoloration. They are then placed in 70% alcohol for 10 to 15 minutes. A wide-mouth medicine dropper or a small curved spatula is recommended for transferring specimens but even this handling can be avoided if the specimens are placed in a small screen bag or a Gooch crucible and transferred as a whole from one solution to another. To continue the process of dehydration specimens are next placed in 95% alcohol for 3 to 5 minutes and then in absolute alcohol for about 5 seconds. Absolute alcohol can be made from 95% alcohol by adding about one-third (by volume) of anhydrous copper sulfate crystals. After dehydration the specimens are placed in creosote U.S.P. for clearing. Delicate specimens should be treated with 50% creosote in absolute alcohol before final treatment with undiluted creosote. Clearing requires only a few minutes. Finally the specimens should be placed on a clean microscope slide, excess creosote removed, and the mounting medium, Canada balsam, added. Culicine larvae are not easily mounted beneath a coverslip unless the tip of the abdomen is cut off so that the breathing tube lies on its side, exposing pecten, hair tufts, and comb scales. Middlekauff recommends that the slide be held for several days to permit the balsam to harden before applying the cover slip, thus preventing the severed tip of the abdomen from drifting.

\* \* \* \*

TABLE IV

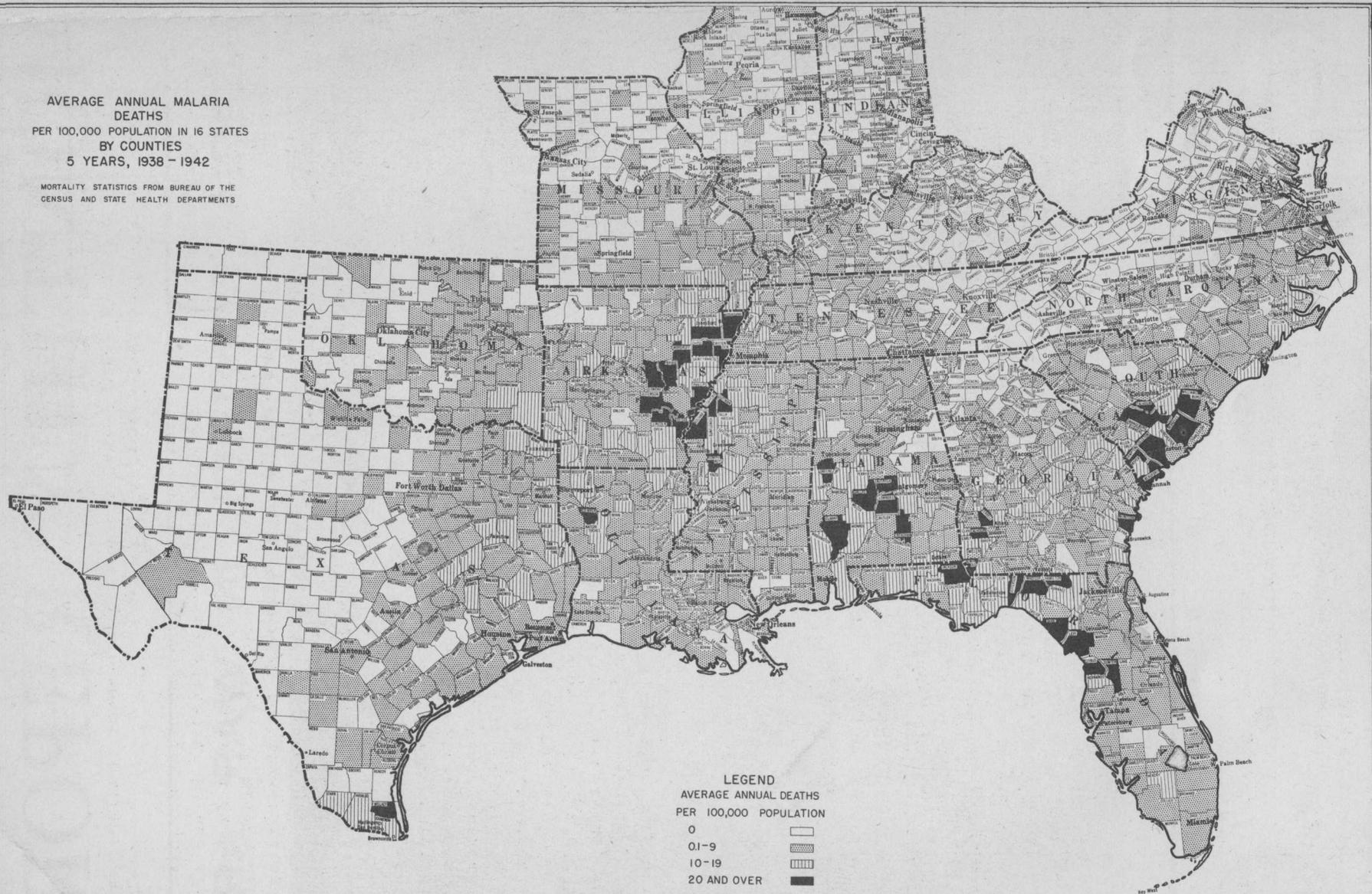
MCWA Encumbrances and Liquidations by Major Items  
For the Month of February 1944

	Continental U.S.	Percentage of Total	Puerto Rico	Percentage of Total
.01 Personal Services	\$ 372,371.35	85.63	\$ 32,411.46	92.95
.02 Travel	13,455.00	3.09	354.45	1.01
.03 Transportation	2,349.29	0.55	-----	----
.04 Communication Services	1,153.07	0.28	15.30	.04
.05 Rents and Utilities	1,946.40	0.44	-----	----
.06 Printing and Binding	-----	----	-----	----
.07 Other Contractual Services	8,712.17	2.00	-----	----
.08 Supplies and Materials	20,551.47	4.72	3,086.62	8.85
.09 Equipment	14,279.15	3.29	1,000.00	2.85
<b>Total</b>	<b>\$ 434,817.90</b>	<b>100.00</b>	<b>34,867.83</b>	<b>100.00</b>
Expenses other than Personal Services	62,446.55	14.37	2,456.37	7.05

# MALARIA DEATHS PER 100,000 POPULATION 1938 - 1942

AVERAGE ANNUAL MALARIA  
DEATHS  
PER 100,000 POPULATION IN 16 STATES  
BY COUNTIES  
5 YEARS, 1938 - 1942

MORTALITY STATISTICS FROM BUREAU OF THE  
CENSUS AND STATE HEALTH DEPARTMENTS



**LEGEND**  
AVERAGE ANNUAL DEATHS  
PER 100,000 POPULATION

0	
0.1-9	
10-19	
20 AND OVER	

Scale of Miles  
0 50 100 150  
PLATE II

From the holdings of the National Archives at Atlanta