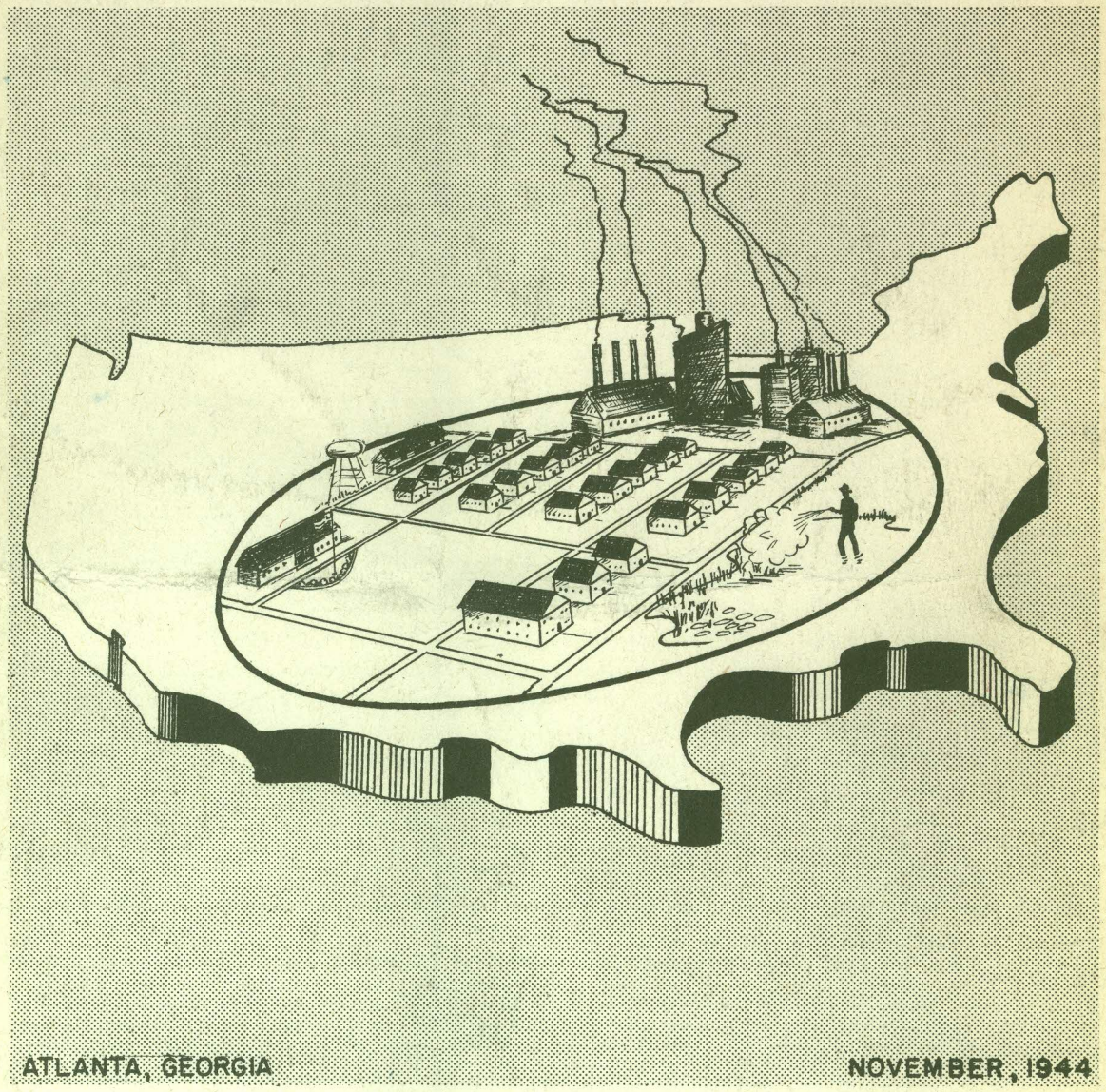
FIELD BULLETIN

IN-SERVICE TRAINING AND INFORMATION

MALARIA CONTROL IN WAR AREAS



ATLANTA, GEORGIA

NOVEMBER, 1944

NORTH CAROLINA MALARIA BLOODSLIDE SURVEY

MOBILE MALARIA CONTROL UNITS - 1944

FEDERAL SECURITY AGENCY U. S. PUBLIC HEALTH SERVICE

RESTRICTED

Courtesy of the David J. Sencer CDC Museum

TABLE I

MCWA LARVICIDE, MINOR & MAJOR DRAINAGE WORK

OCTOBER 1 - 31, 1944

STATE	Areas in Operation	War Establishments Protected	LARVICIDAL WORK				DRAINAGE OPERATIONS												Total Man Hours
			Larvicide Used		Surfaces Treated Acres		Clearing		Cleaning	New Ditching				Ditch Lining Placed		Underground Drainage	Fill	Water Surf. Eliminated	
			Oil Gals.	Paris Green Lbs.	Oiled	Dusted	Removal Surf. Veg. Acres	Stumping Grubbing Acres	Sq.Ft.	Hand	Lin.Ft. Mach.	Dynamite	Total Cu.Yds.	Lin.Ft.	Sq.Ft.	Lin.Ft.	Cu.Yds.	Acres	
Alabama	5	92	318	210	15	160	5.8	---	826,840	1,700	---	---	208	---	---	---	---	9.0	7,106
Arkansas	15	92	14,004	451	956	292	104.2	---	240,700	4,621	1,200	---	1,624	620	7,130	---	---	0.1	26,253
California	4	30	3,087	2	257	2	6.3	---	282,460	820	11,300	---	11,071	---	---	---	---	4.6	3,769
Florida	18	111	6,091	1,285	394	800	28.3	1.7	1,333,896	71,125	---	---	4,132	---	---	---	1,571	11.6	34,556
Georgia	14	103	553	2,848	28	2,229	30.8	0.1	213,852	10,547	---	80	1,148	---	---	---	1,387	5.6	27,162
Illinois	2	54	1,649	80	57	80	3.4	---	---	---	---	---	---	---	---	---	---	---	2,214
Kansas	1	20	190	---	8	---	---	---	---	350	---	---	72	---	---	---	---	---	396
Kentucky	5	48	2,542	13	165	8	3.3	0.2	---	140	---	---	17	---	---	---	65	---	5,631
Louisiana	8	86	53,111	---	2,521	---	73.3	---	1,107,357	56,692	---	14,953	11,100	---	---	---	---	2.7	61,325
Maryland	1	32	---	---	---	---	2.6	---	9,859	470	---	---	17	---	---	---	---	---	2,800
Mississippi	17	58	6,861	289	302	168	67.4	0.1	566,759	4,715	---	---	450	850	1,912	---	140	7.0	19,482
Missouri	4	22	2,235	202	294	111	4.8	---	8,847	3,895	---	---	513	---	---	8	---	---	5,756
New York	--	4	917	1,371	82	748	2.9	---	36,100	1,095	2,130	---	492	---	---	---	---	7.3	3,718
North Carolina	10	80	2,490	7	142	5	106.4	0.9	1,129,756	105,691	---	8,654	11,298	---	---	---	43	18.3	31,363
Oklahoma	9	62	13,021	237	766	168	17.1	---	18,358	6,341	---	---	529	---	---	---	---	---	13,191
Oregon	1	7	---	---	---	---	---	---	18,500	---	---	---	707	---	---	---	---	---	488
Puerto Rico	7	22	3,185	9,660	170	5,171	32.7	5.7	475,578	8,968	---	145	2,231	80	480	---	---	---	55,891
South Carolina	19	114	4,982	150	302	131	139.5	18.2	1,521,636	22,212	---	5,950	7,705	---	---	4,593	122	0.4	54,986
Tennessee	5	67	8,841	2	425	1	4.5	2.5	4,610	1,590	---	---	360	769	1,895	---	57	10.5	11,232
Texas	13	178	15,317	247	768	121	132.8	9.0	783,280	18,314	---	---	1,859	505	2,020	---	28	23.7	44,340
Virginia	4	93	3,297	246	67	376	32.3	---	235,754	15,428	---	380	1,318	---	---	----	---	---	21,737
Total	162	1,375	142,691	17,300	7,719	10,571	798.4	38.4	8,814,142	334,714	14,630	30,162	56,851	2,824	13,437	4,601	3,413	100.8	433,396
Sept. Total	174	1,454	228,195	20,618	12,738	11,258	1,076.1	21.5	8,617,908	113,660	8,180	650	18,087	2,439	6,065	3,350	5,858	205.8	454,258

Courtesy of the David J. Sencer CDC Museum

NORTH CAROLINA MALARIA BLOODSLIDE SURVEY
By Charles M. White

Shortly after the advent of the work relief program in 1933, the Civil Works Administration, which was the relief agency at that time, expressed a willingness to cooperate with the North Carolina State Board of Health on a very extensive malaria control program. The C.W.A. was willing to drain practically any bodies of water within the State which we considered malaria hazards. The E. R. A. and W. P. A., which were the subsequent relief agencies, were equally cooperative.

Under these programs an enormous amount of drainage work was done in the State. Over 3000 miles of hand ditches were dug and approximately 400 miles of canals were excavated with heavy machinery, such as draglines and floating dredges.

While we know that a great deal of good was accomplished by this work, there is no way for us to evaluate it accurately. Prior to that time no organized efforts had been made to determine the existence and cause of malaria in the different parts of the State. Some counties were highly malarious by reputation. In others, the mortality statistics indicated a high incidence, but due to the lack of scientific investigations, the exact situation was not known.

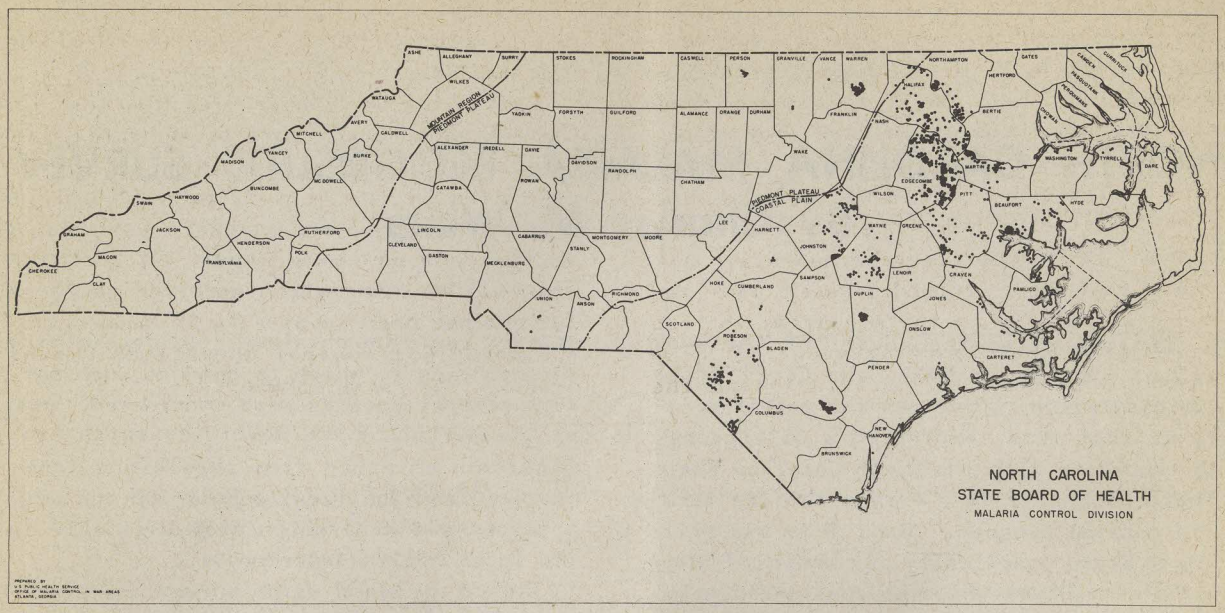
In 1937 a Malaria Investigation and Control Unit was established, consisting of an engineer, an entomologist, and two laboratory technicians, all of whom had specialized training in malariology, in addition to their basic professional education. The purposes of this Unit were to locate the malaria, determine its cause, develop a control program, promote the inauguration of the program, and give general supervision to control operations.

It was decided that blood slide surveys would be the most accurate method whereby a scientific knowledge of the prevalence of malaria could be obtained. In determining the counties in which to conduct such surveys several factors were considered, such as the mortality and morbidity rates, information obtained from physicians, complaints from the local population and suggestions and data which were available in the local health departments.

Before the blood slide survey was started in any county, the local health department agreed to allow its nurses to take the slides under the supervision of the State Unit. Shortly after school opened early in the fall of each year, blood slides were taken from school children in the first six grades. This gave what we considered a representative sample of the population, since about 10% was covered. After the slides were examined, the entomologist and engineer visited each school having positive slides and learned from the principal, bus driver, or others, where each child with a positive slide lived. The exact location was verified by a visit to the home. The residence of each child with a positive slide was indicated on a large county map with a symbol. The density of these symbols showed focal areas.

Complete surveys including the mapping have been made in thirteen malarious counties, and partial surveys have been made in others. The malarious section of the State was covered progressively county by county, starting with Bladen, Edgecombe, and Robeson counties in 1937 and covering Pitt and Wayne counties in 1938; Beaufort, Halifax, Johnston and the malarious portion of Northampton in 1939; the remainder of Northampton, Harnett, Tyrrell, and Washington counties in 1940; and Craven, Martin and Hyde counties in 1941. In 1942 a much wider coverage was obtained but work was concentrated in war areas. Portions of the following counties were sur-

Courtesy of the David J. Sencer CDC Museum



Location of Positive Bloodslides taken during the Years 1937 - 1942.

veyed: Camden, Carteret, Chowan, Craven, Cumberland, Granville, Lenoir, Onslow, New Hanover, Pasquotank, Perquimans, Robeson, Vance, Union, and Wayne. A total of 75,018 slides was obtained of which 794 were found to be positive for one or more of the malaria plasmodia. Location of all positive blood slides, regardless of the year taken, are shown in the accompanying map.

Results are difficult to analyse because malaria varied from year to year and from county to county. For example, the percentage of positive slides from year to year was as follows: 1937 - 3.55; 1938 - 0.81; 1939 - 1.37; 1940 - 0.18; 1941 - 0.18; 1942 - 0.06.

Racial differences in susceptibility to *vivax* and *falciparum* malaria are evident, Negroes showing relative resistance to *vivax* and whites to *falciparum*. Indians were surveyed in Robeson County in 1937. Based upon this limited data it would appear that Indians show a resistance similar to that of whites. While these slides were collected during the period 1937-42, and in various different localities, their distribution geographically and in time is such that the above racial comparison is valid.

TABLE I

Racial Suseptibility to Malaria Plasmodia

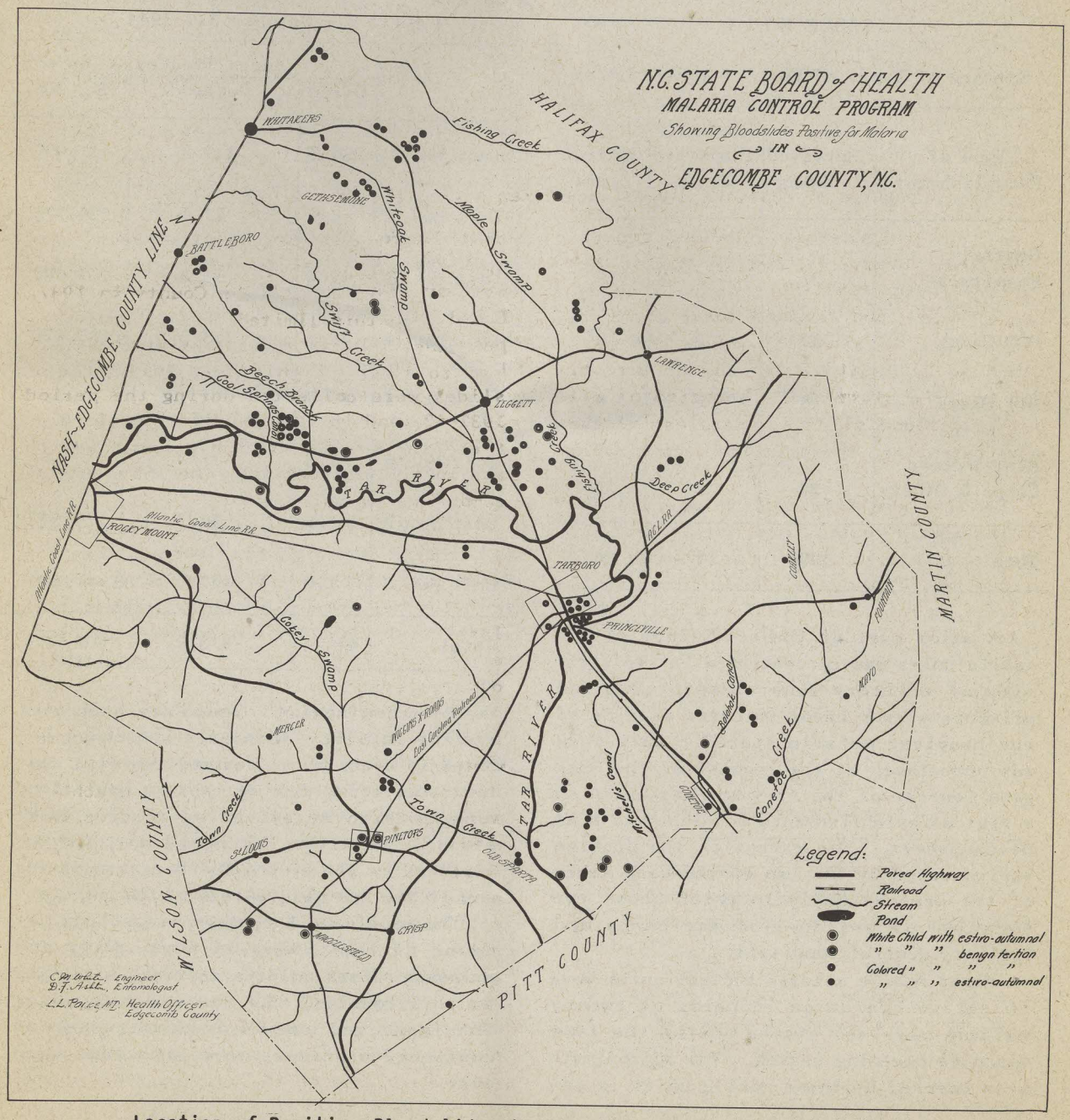
Race	Total Slides	No. Positive for				% of Positives			
		Pf	Pv	Pm	Mixed	Pf	Pv	Pm	Mixed
White	43914	100	194	0	5	33	65	0	2
Indian	1082	14	42	0	4	23	70	0	7
Negro	30022	269	149	2	15	62	34	-	4
Total	75018	383	385	2	24	48	49	0	3

Direct comparison of rates from county to county is dangerous, even during the same year, because of topographic and population differences. It was found that large areas in malarious counties disclosed no positive slides, a mere scattering of positives was found in others, and a high percentage of positives occurred in certain limited areas. In Edgecombe County, where the highest rate in the State was found during 1937, ten schools were entirely negative, while five were over 15% positive, the highest being 42%. Forty-five schools were involved. In areas shown to be highly malarious a special map was made on a large scale showing all of the homes, water courses, bodies of stagnant water and other pertinent information. In order that each home might be accurately referred to, it was given a number. The numbers were nailed at conspicuous places on the homes and placed by

Courtesy of the David J. Sencer CDC Museum

the symbols on the map. These maps were used in making detailed entomological investigations and in the formulation of control programs. They were also very effective in presenting the conditions to financing bodies and resulted in the inauguration of actual control operations in many cases. Pond owners were frequently convinced that their impounded waters were the cause of malaria in certain areas where a heavy grouping of symbols occurred. The formation of drainage districts and the acquisition of W. P. A. aid were often made easier.

Early in the defense program, most of the military establishments in this State were located in malarious counties. Boards appointed by the Army or Navy to select camp sites were in some cases influenced by the data on these maps. On the MCWA Program the information gathered on these surveys has been invaluable in determining the needs for control operations around numerous war establishments.



Location of Positive Bloodslides in Edgecombe County, North Carolina

Courtesy of the David J. Sencer CDC Museum

MOBILE MALARIA CONTROL UNITS - 1944

Mobile malaria control units provide two basic functions: 1) surveillance activities to detect conditions favorable for malaria transmission in the vicinity of military installations most likely to be sources of infection; and 2) maintenance of a nucleus of trained personnel instantly available in case a localized malaria outbreak occurs.

TABLE NO. I

Summary of Types of Work of Mobile Units

Type of Establishment	Surveyed Zones	Regularly Inspected Zones	Control Zones
General Hospitals	21	12	10
POW Camps	53	2	2
Air Bases	18	2	6
Army & Navy Camps & Others	37	2	18
Total	129	18	36

A major part of the activities of the mobile units was concentrated in the vicinity of military general hospitals and prisoner-of-war camps in areas outside of the heaviest malaria states. This work was undertaken at the request of the Surgeon General of the Army and was based on a list of establishments furnished to MCWA Headquarters. The extent of the problem is indicated by the map on the back cover of the present Bulletin which shows the location of prisoner-of-war camps and military general hospitals.

Fight mobile malaria control units were in active operation in parts of twenty malaria marginal states during the 1944 mosquito breeding season. The approximate area covered by these mobile units is indicated by shading on another map on the back cover of this Bulletin. Additional areas in six states were kept under surveillance by one or more surveys during the breeding season. These are indicated by line shading. Hospitals and camps located in areas where resident malaria control activities were already in operation, were covered by extending regular MCWA areas. Under this category are the activities in all of the Southeastern States and in the central valleys of California.

TABLE NO. II

Summarization of Work accomplished by Mobile Units

April 1 - October 31, 1944

	Acres Treated		Clearing
	Oiled	Dusted	Sq. Ft.
Unit No. 1	256.5	319.8	11,000
Unit No. 2	2.4	81.4	24,775
Unit No. 3	42.4	64.6	11,000
Unit No. 4	18.8	268.3	185,970
Unit No. 5	57.0	74.2	
Unit No. 6	1.8	27.4	
Unit No. 7	66.5	20.3	176,540
Unit No. 8	1.0	117.0	400
Total	446.4	973.0	409,685

The mobile unit program was set up because of the number of Army, Navy and prisoner-of-war malaria carriers returning to this country. As the war progresses the increased number of carriers makes continual vigilance more important than ever.

Courtesy of the David J. Sencer CDC Museum

HEADQUARTERS NOTES

TRAVEL CURTAILMENT

There has been a heavy drain on the MCWA travel allotment during the first part of this fiscal year because of transfers coincident with expansion of malaria control activities. All personnel in travel status have been instructed to plan their work very carefully and exercise good judgement in order to stay within our allotment without neglecting necessary duties.

CONTROL IN WATER CHESTNUT AREAS OF THE POTOMAC RIVER

Satisfactory control of *Anopheles quadrimaculatus* Say was obtained during the 1944 season in water chestnut areas of the Potomac River. Cutting operations by the U. S. Engineers reduced the extent of breeding areas by 85% over the 1943 season.

During 1944 paris green was applied by airplane at Fort Belvoir and at the Quantico Marine Barracks at weekly intervals for twelve weeks between July 7 and Sept. 22. The area dusted varied from 990 acres on July 14 to 440 acres on Sept. 22. A total of 7,610 acres was dusted and 8,791 pounds of paris green were applied.

SANTEE-COOPER SURVEY

Recent work on the Santee-Cooper Impoundment includes investigation of methods of timber clearing. Trials have been run of dynamiting and burning and underwater cutting.

INSECT CONTROL MEETINGS OF THE OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT

A representative of the Headquarters Office participated in meetings of two subcommittees of the Committee on Medical Research (O.S.R.D), on November 17 and 18. Subjects of entomology and physical chemistry and engineering were discussed including a review of the operational investigations being conducted by the Public Health Service Office of Malaria Control in War Areas. This participation in the investigation of the rapidly developing techniques and materials for use in malaria control is essential to the successful prosecution of the MCWA program, since in this way technical development is kept parallel to field control. Contributions of MCWA to the advance of knowledge in malaria control, based upon field operations on the home front, may be expected to be of value in military operations behind the assault stage in areas outside the continental United States.

PROFESSIONAL PERSONNEL

Jr. Asst. San. (R) Dorothy Fawcett was commissioned during November. Transfers include Asst. Eng. (R) Arve H. Dahl from Denver, Col. to Honolulu; Asst. San. (R) Willis W. Wirth from Miami, Fla. to Atlanta, Ga.; Asst. San. (R) J. J. Pratt from Miami, Fla., to Los Angeles, Cal.; Asst. San. (R) John W. Zukel from Dixon, Ill. to Camilla, Ga.; Asst. San. (R) Stephen P. Hatchett from Belleville, Ill. to Houston, Texas; and Asst. San. (R) Charles J. Rohde from Herren, Ill. to Miami Beach, Fla.; P. A. Eng. (R) Milton M. Price from Bethesda, Md. to Wynne, Ark.; P. A. Eng. (R) J. H. Coffey from Louisville, Ky. to Jacksonville, Fla.; P. A. Eng. (R) John Burgess from Alexandria, La. to Little Rock, Ark.; and P. A. San. (R) Don E. Eyles from Columbia, S. C. to Swannanoa, N. C.

CONFERENCE OF DISTRICT DIRECTORS

The directors of the Public Health Service Districts most intimately concerned with malaria control met with officers from Washington and Atlanta on Dec. 4-5, 1944. The meeting was devoted to evaluating the present MCWA program and outlining plans for the new extended malaria control program. Each MCWA Division chief presented his plan for future operations. The following representatives from Washington were in attendance: Asst. Surg. General J. K. Hoskins, Sr. Surg. J. A. Trautman, Sr. Surg. F. L. Burney, and Sr. Surg. J. O. Dean. District Directors attended as follows: Medical Directors K. E. Miller, F. V. Meriwether, W. K. Sharp, C. C. Applewhite, and O. L. Anderson. Eng. (R) E. C. Garthe attended in place of Medical Director E. R. Coffey of District I.

Courtesy of the David J. Sencer CDC Museum

DIVISION NOTES

AEDES AEGYPTI DIVISION

With the close of the regular breeding season the *Aedes aegypti* Division has converted to its attack on overwintering stages of *aegypti*. In this connection Asst. San. (R) S. P. Hatchett has again been assigned to Special Consultant Asa Chandler, Supervisor of the Texas *Aedes aegypti* program, to study overwintering of *aegypti* eggs and to develop a satisfactory ovicide for field use. Control programs are stressing the rooting of water plants in dirt to eliminate this important source of *aegypti* breeding inside of houses. The *aegypti* control unit in Mobile, Ala. is attacking winter breeding places and sources of overwintering eggs by means of a sanitary survey of the city. This work is being done in cooperation with the city sanitary inspectors.

ENGINEERING DIVISION

The "Zonal Project Watered Area Census" is progressing satisfactorily. Reports are coming in at a rate which promises a practically complete return by January 1, 1945. Information included in these reports will be very useful for analysis of the over-all operations of Malaria Control in War Areas.

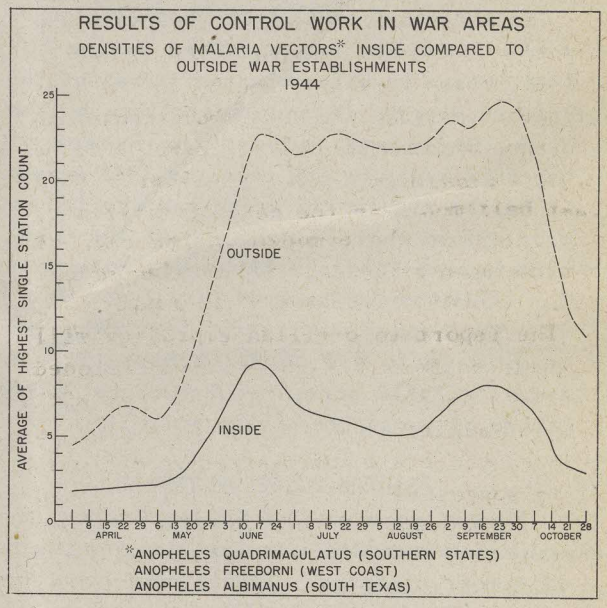
Recent research in airplane dusting has shown that the amount of deposit of paris green and the width of the swath depend upon the size of the particles. Large particle size is preferred because the resulting dust cloud is less subject to wind drift. The Equipment Unit has now contracted for airplane dusting paris green with 75% of the particles larger than 20 microns and none larger than 100 microns.

MEDICAL DIVISION

The Medical Division is correlating data in connection with the study of 30,000 blood slides taken by the Santee-Cooper Survey. Differences in race susceptibility to the species of plasmodia are being tested for significance and comparisons are being made of the malaria rates in various areas. Also size of household is being compared with malaria incidence.

ENTOMOLOGY DIVISION

Vector density data are now available for the entire 1944 season. The curve based upon averages of highest single station counts inside of control areas was again kept below 10 whereas a peak of 25 was reached outside of control areas. In 1944 malaria vector breeding started about one month earlier than in 1943 and reached a peak one month earlier. The late season bulges in the 1943 curves became very pronounced in late September of 1944, resulting in a clearly bimodal curve for densities inside of control areas.



TRAINING DIVISION

In-Service Training included a one-day short course for the Fourth group of Headquarters clerical personnel. Jr. Asst. San. (R) C. A. Hemmer took the complete course during November and Doctors W. W. Young, Wei Chang, and K. F. Yoo, health officials from China, spent four days studying training methods from November 13th to 16th.

Photographic work has now been centralized in the laboratory in the Rialto Building. The new laboratory is set up to produce prints, enlargements and slides in large quantity. Processing of film strips will be one of its most important functions.

Courtesy of the David J. Sencer CDC Museum

ADMINISTRATIVE DIVISION

Arrangements have now been completed for Headquarters personnel to be on call to assist State administrative offices in the preparation of vouchers, payrolls, property returns, etc. during peak loads.

INCOME TAX RETURNS

Sometime before January 31, 1945, the Headquarters Office will notify all employees of the total wages paid during the calendar year 1944, as well as the Federal income tax withheld on such wages for income tax purposes.

In view of the wording of the law, only wages *actually received* in 1944 are considered for income tax purposes. The wages for the full twelve months were earned in 1944; but the last half month, in the case of civilians, and the last whole month, in the case of commissioned officers, will be *actually paid* in 1945. Therefore, this last half month in the case of civilians, and the last whole month in the case of commissioned officers, will *not* be included in your 1944 Income Tax returns.

The report to civilian employees will be made on Form W-2 and to commissioned officers on Form 1099. These forms will be transmitted in duplicate to employees through the State administrative offices. It is suggested that each employee retain the carbon copy of the form for his own records and that the original be completed or used for income tax purposes. Additional copies of this form are also being forwarded to the Collector of Internal Revenue and to the appropriate agency in the various states which have income tax laws.

In many cases the income tax regulations have been simplified this year, and it will be possible for the employee to have the Internal Revenue Collector figure his tax provided certain conditions exist. Generally these conditions are:

First, that your total income from all sources is less than $5,000; second, that all of it comes from wages, salaries, and dividends; third, that income taxes have been deducted from your wages during 1944; and fourth, that your interest, dividends, and wages from which tax has not been withheld, are not more than $100.00.

If your circumstances are such that the above conditions apply, you may use the withholding receipt Form W-2 (Rev.) as your return. (Anyone having more than $500 gross income must file a return.) You merely fill it in and mail it to your local Collector of Internal Revenue by March 15, 1945. The collector will figure your tax and give you credit for the tax already paid. He will than send you a bill for any balance due or he will refund the amount the Government owes you. Joint returns can also be filed on Form W-2. It should be noted that the use of this form automatically allows you about 10 per cent of your total income as deductions and it is not necessary to list any additional deductions on your withholding receipt. If, however, your deductions exceed 10 per cent of your total income it will in most cases be advantageous for you to claim your actual deductions in detail by filing Form 1040.

If you get more than one withholding receipt for 1944 you will be required to fill out only one receipt and attach the others to it. For this reason you must be careful not to lose any of your receipts. In filling out Form W-2 your attention is directed to the information to be filled out on the reverse side of the form.

Form W-2 will not be prepared for commissioned officers since no tax has been withheld on their salaries and it will therefore be necessary for such employees to use Form 1040. Information for this form will be supplied for commissioned officers on Form 1099.

LEAVE RECORDS

A new leave record system is being set up in accordance with latest Civil Service regulations. Consolidated time and attendance forms will be used in place of the monthly leave report and the time sheet.

WITHHOLDING TAX TABLES

A revised manual letter has just been issued to the states regarding new withholding tax tables. By means of these tables it will be possible to more nearly compute the actual tax for each pay period.

Courtesy of the David J. Sencer CDC Museum

LITERATURE REVIEW

"Handbook of the Mosquitoes of North America", by Robert Matheson, 314 pp. 33 plates, 2nd ed., 1944. The Comstock Publishing Company, Ithaca, New York. $4.00

In the first edition of his Handbook, published in 1929, Dr. Matheson presented the most concise and understandable treatise on the biology and classification of North American mosquitoes that had appeared up to that time. This second edition of the Handbook which has been extensively revised and brought up-to-date by the addition of descriptions of new species, new identification keys and discussions of other advancements in culicidology will be welcomed by all workers with mosquitoes.

The subject is treated in two parts: (1) "Mosquitoes: a Comprehensive Survey", and (2) "A Systematic Account of North American Mosquitoes." The only innovation is the inclusion in the first chapter of Part 2 of a discussion of the subfamily Chaoborinae with tables for identification of species. The bibliography has been expanded to include sources of information, and these sources are classified by content.

Part 1 includes: (1) "Characteristics of Mosquitoes", which treats of larvae, pupae, and adults; (2) "The Biology of Mosquitoes", which covers the life cycle; (3) "Mosquitoes in relation to Human Welfare", which gives briefly the ways in which mosquitoes affect man; (4) "The Problem of Mosquito Reduction", which discusses fundamental principles of control; and (5) "How to study, Collect, Rear and Preserve Mosquitoes", which describes the methods used by the author in his experience with mosquitoes.

In Part 2, new keys to genera and species have been presented and new illustrations added. As far as was possible all of the mosquito species occurring in North America, excluding Mexico, are described. The characters for separating species in the keys are those at present believed to be most reliable. It is anticipated, however, that those not acquainted with the ranges of variation in these characters still will have some difficulty using them. The species descriptions have been painstakingly prepared with emphasis on diagnostic characters.

Of interest to the systematist is the author's treatment of the genus *Anopheles*. He has accepted full specific status for the species of the *crucians* complex, *crucians*, s.s., *bradleyi* and *georgianus*, and without discussion has given specific rank to *franciscanus* in the *pseudopunctipennis* complex. Also, no mention is made of *boydi* Vargas, considered by Aitken as a synonym of *franciscanus*. It might have been desirable to devote a few more lines to synonomy of some of the more common species, particularly *Aedes aegypti*, *Culex pipiens* and *Culex quinquefasciatus*. In the case of *aegypti*, for instance, this species is still often referred to as *calopus* or *argenteus* and no mention is made of these names. Some confusion may be caused by the note given under *C. quinquefasciatus* in which it is stated that "it would seem advisable to adopt the name *fatigans* (for this species) since it is used in all other literature and has been accepted by Edwards (1932)." It might have been better had the author used the name *fatigans* and then made a formal appeal for adoption to the International Commission on Zoological Nomenclature.

The book is nicely illustrated. The drawings of male genitalia are particularly fine and this painstaking work is worthy of special commendation.

The notes on specific biologies and distribution are, in most cases, quite brief and general. Fuller discussions of these no doubt would be welcomed by most users of the book. However, as the author states, a careful selection of material was necessary in order to keep the size of the book within prescribed limits.

Dr. Matheson is to be commended for preparing this timely revision of his Handbook which will be of great assistance to the mosquito control workers of the country. ---- G. H. Bradley.

Courtesy of the David J. Sencer CDC Museum

TABLE II

MCWA EXPENDITURES AND LIQUIDATIONS BY MAJOR ITEMS

OCTOBER 1944

	Continental U. S.	Percentage of Total	Puerto Rico	Percentage of Total
.01 Personal Services	$ 400,695.79	72.16	19,831.55	86.89
.02 Travel	24,162.99	4.35	90.62	.40
.03 Transportation of Things	6,791.75	1.22	-----	-----
.04 Communication Services	1,596.63	.29	14.65	.06
.05 Rents and Utilities	2,211.12	.40	-----	-----
.06 Printing and Binding	2,165.64	.39	-----	-----
.07 Other Contractual Services	36,620.04	6.60	-----	-----
.08 Supplies and Materials	44,580.52	8.03	2,825.77	12.38
.09 Equipment	36,430.91	6.56	61.20	.27
Total	$ 555,255.39	100.00	22,823.79	100.00
Expenses other than Personal Services	154,559.60	27.84	2,992.24	13.11

TABLE III

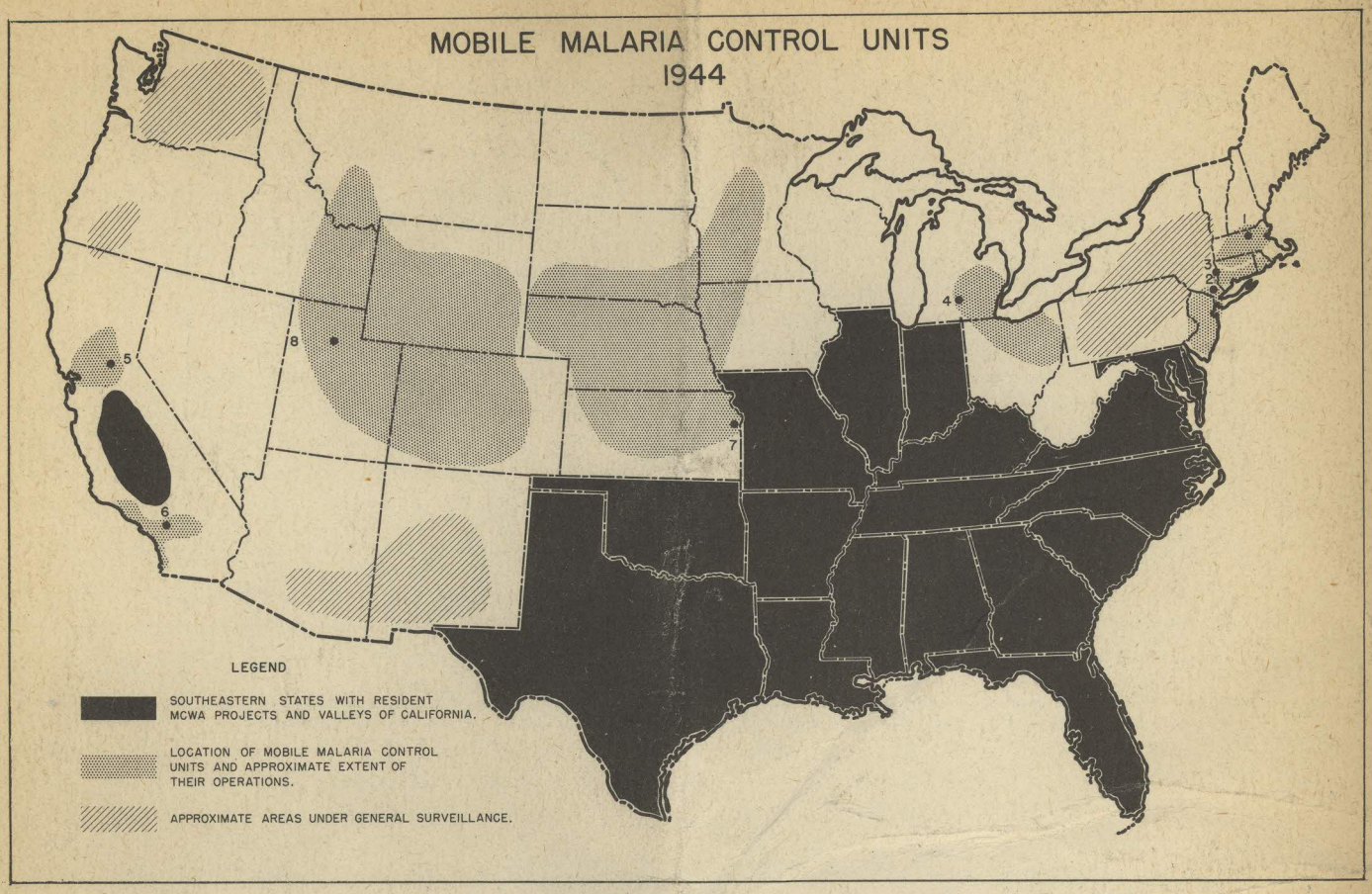
MCWA PERSONNEL ON DUTY AND TOTAL PAYROLL

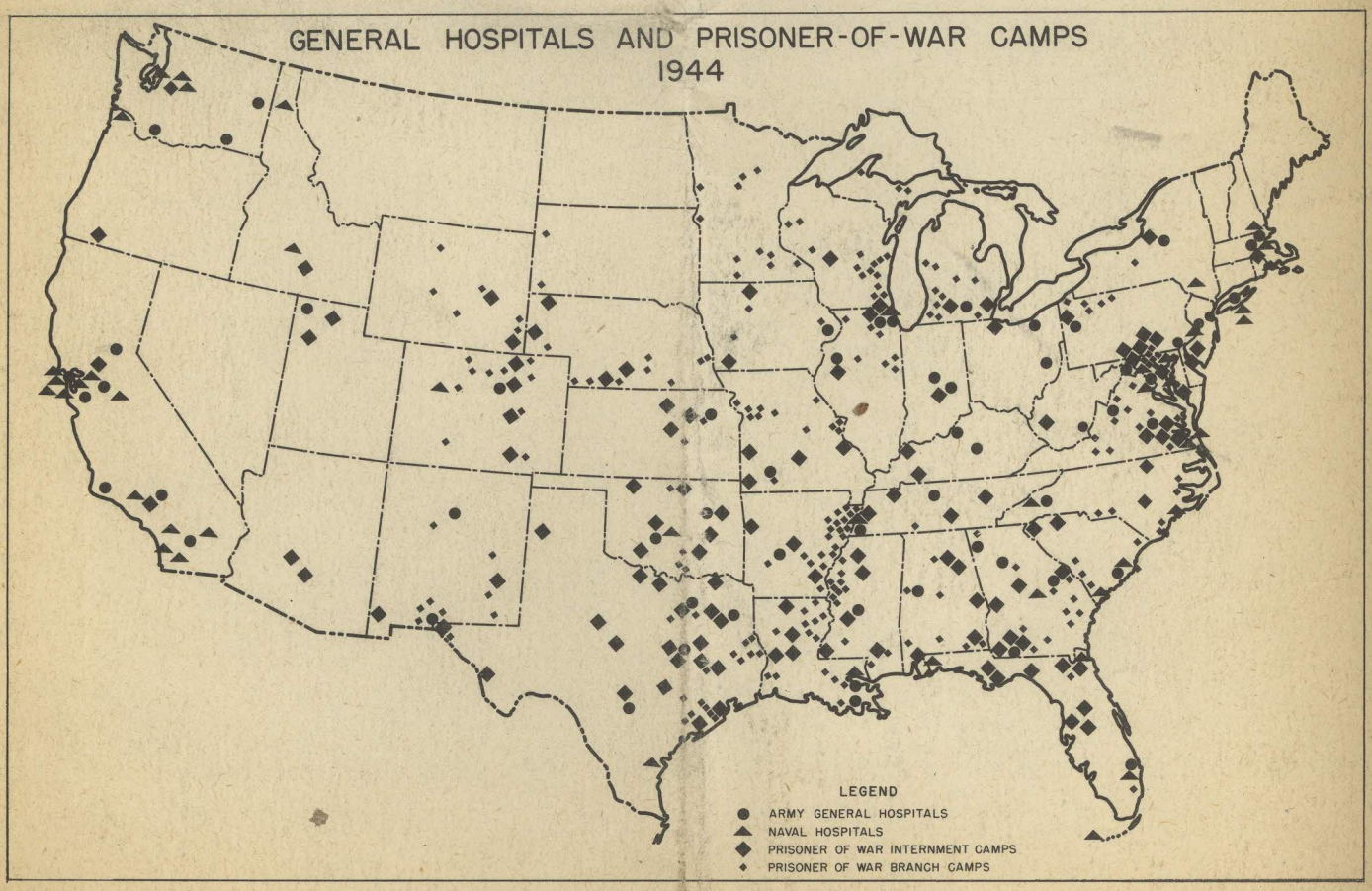
OCTOBER 1944

State	Commissioned		Prof. & Sci.		Sub-Prof. (1)		C. A. F.		Custodial and Per Hour		Total		Percent of Total	
	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay
Alabama	3	855	1	264	3	547	1	164	29	3,911	37	5,741	1.35	1.36
Arkansas	7	1,947	7	2,051	28	5,559	5	884	109	14,963	156	25,404	5.69	6.04
California	4	988	---	---	5	1,115	3	623	18	2,636	30	5,362	1.09	1.27
Dist. of Columbia	2	635	---	---	3	468	1	233	1	228	7	1,564	.25	.37
Florida	6	1,788	4	1,278	20	3,576	6	2,272	176	21,674	212	30,588	7.73	7.27
Georgia	8	2,375	2	527	38	7,393	6	1,161	92	12,396	146	23,852	5.32	5.67
Illinois	6	1,745	2	111	---	---	3	562	15	1,306	26	3,724	.95	.88
Indiana	2	570	---	---	2	183	---	---	8	789	12	1,542	.44	.37
Kentucky	4	1,247	2	537	8	1,456	1	190	19	2,929	34	6,359	1.24	1.52
Louisiana	9	2,725	4	1,221	45	8,813	6	1,038	276	36,425	340	50,222	12.40	11.94
Maryland	2	533	---	---	1	331	2	438	5	1,178	10	2,480	.36	.59
Mississippi	6	1,807	3	801	10	2,369	4	566	77	10,975	100	16,518	3.65	3.93
Missouri	3	1,000	1	36	13	2,392	7	787	23	2,913	47	7,128	1.71	1.69
North Carolina	6	1,664	4	1,297	7	1,440	4	690	140	18,579	161	23,670	5.87	5.63
Oklahoma	5	1,500	1	269	10	2,443	1	181	14	4,643	31	9,036	1.13	2.15
Oregon	---	---	1	263	1	203	---	---	---	---	2	466	.07	.12
Puerto Rico	8	2,562	1	297	3	679	5	1,066	325	15,228	342	19,832	12.49	4.72
South Carolina	5	1,482	4	1,305	13	4,416	6	2,566	148	23,311	176	33,080	6.42	7.87
Tennessee	4	1,323	3	841	5	1,247	3	594	51	6,270	66	10,265	2.41	2.44
Texas	6	1,719	4	1,289	27	5,733	6	1,015	196	25,510	239	35,266	8.72	8.39
Virginia	3	904	2	696	12	2,387	3	602	108	14,819	128	19,408	4.67	4.62
AEDES AEGYPTI														
Alabama	1	285	---	---	9	1,400	1	146	---	---	11	1,831	.40	.43
Florida	1	285	2	537	35	6,633	2	292	---	---	40	7,747	1.46	1.84
Georgia	---	---	---	---	5	1,055	---	---	---	---	5	1,055	.18	.25
Louisiana	1	285	2	264	24	2,418	2	164	1	62	30	3,193	1.09	.76
South Carolina	1	285	---	---	10	1,845	1	164	1	120	13	2,414	.47	.57
Texas	5	1,325	1	177	29	5,693	2	310	7	855	44	8,360	1.60	1.99
Hq. & Dist. (2)	78	25,486	13	3,186	48	8,191	120	20,797	24	3,534	283	61,194	10.33	14.55
Mobile Units	2	809	1	118	2	618	---	---	9	1,680	14	3,225	.51	.77
Total	188	58,129	65	17,365	416	80,603	201	37,495	1,872	226,934	2,742	420,526	100.00	100.00
Percent of Total	6.86	13.82	2.37	4.13	15.17	19.17	7.33	8.92	68.27	53.96	100.00	100.00		

(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.

Courtesy of the David J. Sencer CDC Museum





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