

E. E. Lynch and Louis Edgell, Delaware State Highway Department; Edwin M. Barry, Delaware Board of Game and Fish Commissioners; Dr. Clayton M. Hoff, Delaware Natural History Society; Melvin C. Hoff, Oberlin College, Ohio; John I. Cahalan and L. L. Maxwell, local W.P.A. officials; John R. Bittle, representing the Mayor and Council of Delaware City; and Prof. Geo. L. Schuster, Dr. L. A. Stearns, Donald MacCreary and C. B. Huffaker, Delaware Agricultural Experiment Station.

THE ASSOCIATION "INVADES" THE SOUTH

Report Covering Tour to Inspect Mosquito Work in the T.V.A. and U.S. Public Health Service Work in and about Memphis, Tenn., September 22-26, 1941

by L. A. Stearns

Arrangements for this tour were made by a Committee composed by Mr. R. E. Dorer, Chairman, (U.S.P.H.S., Norfolk, Va.) Dr. Joseph M. Ginsburg, (N. J. Agri. Exp. Station, New Brunswick) and Dr. F. C. Bishopp (U.S. Bur. Ent. and Plant Q., Washington, D. C.). Inasmuch as both Mr. Dorer and Dr. Bishopp found it impossible to make the trip, the final details were taken care of by Dr. Ginsburg.

The inspection group included the following members of the Association:

- Dr. T. J. Headlee, N. J. Agricultural
Experiment Station
- Thomas D. Mulhern, N. J. Agricultural
Experiment Station
- Dr. Joseph M. Ginsburg, N. J. Agricultural
Experiment Station
- L. D. McCarter, Hudson Co., N. J. Mosquito
Extermination Commission
- Marcus Donnelly, Hudson Co., N. J. Mos-
quito Extermination Commission
- Lester Smith, Middlesex Co., N.J. Mosquito
Extermination Commission
- James Hart, Morris Co., N. J. Mosquito
Extermination Commission
- Oliver Stivers, Essex Co., N. J. Mosquito
Extermination Commission
- Walter Henderson, Ocean Co., N.J. Mosquito
Extermination Commission
- J. L. Clarke, Des Plaines Valley, Mosquito
Abatement District, Lyons, Illinois
- Dr. L. A. Stearns, Delaware Agricultural
Experiment Station

All of the party went by machine with the exception of McCarter, Donnelly, and Clarke.

The trip to Knoxville, as made by Mulhern, Ginsburg, Henderson and Stearns, required two and one-half days (September 19, 20 and 21). It followed the Skyline Drive, in Virginia, the maximum elevation being 3590 feet, and included stops at the Luray Caverns and at the State Agricultural Experiment Station (V.P.I.), Blacksburg.

Following arrival at Knoxville, the campus of the University of Tennessee was visited on the afternoon of the 21st. Some time was also spent in going through the greenhouses on the College of

Agriculture grounds, inspecting work in progress at the Experiment Station, and making a trip through the farm orchards.

That evening, at the Hotel Farragut, gave opportunity for discussing the tour which was to commence the following day with C. C. Kiker, W. G. Stromquist, and F. E. Gartrell, representing the T.V.A.

Monday, September 22 - The group left Knoxville with C. A. Evans, Resident Sanitary Engineer, Watts Bar Dam, and his associate, E. R. Lacey, for a trip through various parts of Watts Bar Reservoir to view clearing operations and the final reconditioning of the zone of water fluctuation immediately prior to filling. Timber and brush were being cut close to the ground and then burned.

A stop was made at Mr. Evans' headquarters at Kingston, and lunch was provided at the Mess Hall at Watts Bar Dam.

The inspection party drove, thence, to Chattanooga for a meeting in the Health and Safety Department offices. In the absence of the Director, Dr. E. L. Bishop, the group was greeted by Dr. D. A. Reekie, Chief of the T.V.A. Medical Staff, and was shown a four-reel movie covering, in a broad way, the T.V.A. operations. They were then placed in charge of E. H. Givham, Resident Sanitary Engineer, Guntersville Reservoir.

En route to Huntsville, Alabama, stops were made to view breeding conditions at various points near Hales Bar Dam and along the Guntersville Reservoir. The boat spraying equipment (5 boats, valued at about \$1,000.00 each) used on this Reservoir was also inspected.

An outstanding fact noted at this and all other points visited on the tour was that the New Jersey light trap failed to collect A. quadrimaculatus in appreciable numbers at any of the many collection stations about these reservoirs.

The night was spent at the Russel Erskine Hotel, Huntsville.

Tuesday, September 23 - C. D. Fairer, Resident Sanitary Engineer, Wheeler Reservoir, served as guide for the day, taking the group from Huntsville through Wheeler Reservoir, with lunch at his headquarters, Decatur, Alabama, and thence, to Florence, Alabama, (Andy's, Hotel Reeder) for the night.

Immediately after leaving Huntsville, the party drove through the government arsenal which is now under construction. This project covers an area of 49 square miles and will cost approximately \$41,000,000.00.

In making the trip through Wheeler Reservoir, which is in the fifth year of impoundage, general conditions were observed and, in particular, Malaria mosquito breeding areas. A demonstration of air-plane dusting was put on by James Jackson. Both stump and other areas heavily vegetated with cow lily, Nymphaea advens, were dusted with a mixture composed of Paris Green, 1 part, and soapstone, 20 parts. The dust hopper of this plane has a capacity of 1,000 pounds and in actual operations as much as 17,000 pounds are commonly applied in a single morning's work.

This Reservoir has a shore line of about 120 miles and includes some 65,000 acres, 10,000 of which must be cleared every fall to eliminate vegetation

where breeding occurs. One of the most important plants is smartweed, Polygonum persicaria. The cost of clearing is about \$5.00 per acre. The prevailing wage paid workers this year is 50 cents per hour, as compared with \$1.00 per day paid ordinary farm labor in this section of Alabama.

At Mr. Fairer's headquarters in Decatur, the service shop and office were visited. Among the tools used in connection with the removal and destruction of vegetation along the shores of the reservoir, perhaps the most interesting were a mower tooth hand rake and a mobile unit, used for cutting emergent vegetation. This last piece of equipment is a metal-bottomed boat (12'8" long, 4' wide, 1' deep) manufactured by C. L. Hockney, Silver Lake, Wisconsin. It is known as an "Underwater Weed Cutter" and sells for \$600.00. It moves at the rate of 6 m.p.h. and, when cutting, operates at 4 m.p.h. The cutter blade, which is of the mower tooth type, is 10 feet in length and can be set to cut vegetation at all depths from water level to 5 feet beneath the surface.

Opportunity was also given to view a joint project with the U.S. Fish and Wildlife Service of diking and dewatering which is now under construction.

Considerable mosquito proofing of farm houses is being done in this area by the T.V.A. at no expense to the owners. The cost of such treatment for doors, windows, fire places, walls and floors - the screening of windows and doors, closing of fire place openings, covering walls with heavy brown paper and floors with tar paper - is about \$50.00 per house and probably exceeds the value of many of these shacks. The contract price for

the current season for doors constructed and in place is \$3.50 each. It is expected that mosquito proofing of this kind will last for about 4 years.

Wednesday, September 24 - The greater part of the morning of this day was spent in the company of Dr. R. B. Watson, in charge of the office and laboratory at Wilson Dam, H. S. Hurlbut (Entomologist), C. W. Kruse (Sanitary Engineer), and T. F. Hall (Botanist). The various types of experimental work carried on in the laboratories there were viewed as well as the insectary conditions for breeding A. quadrimaculatus.

A twenty-mile motor-boat trip was taken through Wilson Reservoir, during which a demonstration was given of treating the shore line with a spray composed of Black Oil, 4 parts, and Kerosene, 1 part, for the destruction of various types of vegetation, including "alligator grass," an introduction from further south which is giving considerable difficulty.

Following a lengthy drive across the corner of Mississippi, the night was spent at the Wm. Len Hotel, Memphis, Tennessee.

Thursday, September 25 - The entire day was spent in and about Memphis inspecting mosquito-control work, looking over ditch-lining projects, stopping at the University of Tennessee Medical School to view malaria control research facilities, and visiting the U.S.P.H.S. headquarters for malaria control. The group was attended by Mr. H. A. Johnson, Executive Officer, U.S.P.H.S.; his associate, W. N. Parker; M. W. Yates of the City Health Department, and H. G. Tuggle, Sanitary Engineer of the Shelby County Health Department.

Within the City of Memphis there are some 300 miles of drainage, about 80 miles of which have been lined with concrete since 1936. It was estimated that a crew of three experienced men could put in from 3 to 400 feet per day of concrete ditch, two feet in width. This city, which has a population of about 290,000, covers 48 square miles. For inspection purposes, it has been divided into 48, one-square-mile areas in each of which there are five stations established for weekly observations on the prevalence of malaria-transmitting mosquitoes. The stations in each of these square-mile areas include (1) culverts, (2) stables, (3) out-houses, (4) outside toilets and (5) under houses, in each of which 50 square feet of area are examined per minute for ten minutes at each weekly inspection.

During the latter part of the morning, the party attended a meeting of the Howard-Krauss Society at the Central High School. This Society was organized by Colonel J. A. LePrince, and was so named in honor of Dr. L. O. Howard, former chief of the U. S. Bureau of Entomology, and the late Dr. Wm. Krauss of the Medical School of the University of Tennessee at Memphis. Its slogan is "Educate to Eradicate Malaria". The students, under the direction of Miss Annkay Tharpe, presented a most interesting program which dealt with the history and aims of the organization and included also an entertaining "quiz period." Each of the visitors was provided with a copy of "The Triple S" school paper which was given-over entirely to articles relating to malaria and mosquito control. Following this meeting, lunch was taken in the High School Cafeteria.

In the early afternoon, concrete-lined ditches were inspected in various parts of Shelby County

immediately outside the City limits. A demonstration of oiling was viewed in which the larvicide was composed of 9 parts of crankcase oil and 1 part of kerosene. At the County headquarters for such work, they have three, 17,000 gallon tanks for the storage of crankcase oil.

Following the trip about Shelby County, the group gathered at the U. S. P. H. S. headquarters at the University of Tennessee Medical School, at which time "Recent Laboratory Developments in Malaria and Pest Mosquito Control of Importance to the National Defense Effort" and "The Organization of Mosquito Control Work in Areas Important for National Defense" were discussed by J. L. Robertson, Sanitary Engineer. In the course of his discussion, some consideration was given the school for public health personnel now located at Norfolk, Virginia. This is an orientation course covering malaria and mosquito control work. The first two sessions had a total attendance of approximately 100; the third is scheduled for the period September 30 to October 15, 1941. Both an outline and a detailed schedule covering the session about to take place were provided for future reference.

Following Mr. Robertson's presentation of the topics listed, Mr. H. A. Johnson summarized recent experimental work with the Phenol larvicide which is commonly used in army camps. A report covering this work is contained in the Public Health Report, Volume 56, Number 33, August 15, 1941. When used as recommended, Mr. Johnson and his associates found it ineffective for mosquito control and toxic to fish.

Charts dealing with the malaria cycle were shown and the statement made that it was due for an up-turn in 1942.

Attention was directed to the impoundments in the Mississippi River from Iowa northward which, it seems certain, will create wide-spread malaria control problems.

In discussing future work to be undertaken at this headquarters, Mr. Johnson stated that they plan to study, in a broad way, the question of naturalistic control, in which such factors as temperature, humidity, light, pH, and various types of vegetative cover will be dealt with under controlled conditions.

They also intend to determine the response of malaria mosquitoes to "inaudible" vibration and "invisible" light. The force at Memphis, which were transferred from Savannah, Georgia, some time ago, have good facilities for work of this kind and also the laboratories and insectary space and equipment to carry on the breeding of A. quadrimaculatus and malaria studies with several animals including monkeys, rabbits, guinea pigs, etc. The inspection tour ended with this meeting. (Night at Memphis).

The return trip was made on September 26, 27 and 28, the night of the 26th being spent at the Gatlinburg Inn, Gatlinburg, Tennessee, and that of the 27th at the Danville Hotel, Danville, Virginia. This route provided an opportunity to visit the Great Smokies which reach an elevation of 6310 feet at the highest point. The total trip covered 2512 miles.