

has been visiting camps and giving all possible help information on insect problems. Work is under way on general repellent, for mosquitoes, chiggers, sand flies and dog flies. This work is being supported with money received for that purpose from the National Emergency Council, and is proceeding in utmost secrecy. Headlee's office has cooperated freely, and it is noted that information cannot be given out, in return for the help received.

Mr. W. G. Bradley has been loaned to the United States Public Health Service to coordinate malaria mosquito inspections and control in the several southern states.

Recently the Bureau has been called into consultation with reference to two large war projects, a large salt pond that is being built in the middle of a salt marsh area, and the Alaskan Highway, which will pass through great mosquito breeding areas.

PLANS FOR AN INVESTIGATION TO DETERMINE
THE MEANING OF CATCHES OF ANOPHELES
QUADRIMACULATUS IN ELECTRIC LIGHT TRAPS

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Introduction

The reason for undertaking these proposed studies is in the fact that while the electric light traps catch a greater or less number of Anopheles quadrimaculatus, they are thought not to catch a sufficiently representative sample to be significant. This indictment of the performance of the electric light trap

comes primarily from the sub-tropics and the tropics, although recently similar data has been collected by Dr. Stearns' organization in Delaware in the neighborhood of Fort DuPont.

In view of the fact that the electric light trap does sample the bulk of the mosquito fauna of the point in which it works in a rather satisfactory manner, and in view of the further fact that it does catch greater or less numbers of Anopheles quadrimaculatus, it is thought worthwhile to see whether we can learn to read the significance of the Anopheles quadrimaculatus catch in terms of the density of Anopheles quadrimaculatus on the wing. In the northeastern states and in the northern section of the Middle Atlantic States, Anopheles quadrimaculatus breeding is sporadic and the overwintering reduction of the adults is very large. The prevalence of malaria in these states is like wise sporadic and rarely of endemic character. The southern section of the Middle Atlantic States and the Southeastern States, on the other hand, exhibit a fair to well established prevalence of the breeding of Anopheles quadrimaculatus and correspondingly a fair to well established prevalence of malaria. Furthermore, overwintering losses of adult Anopheles quadrimaculatus are probably greatly reduced.

While it is believed possible in the northeastern states and in the northern section of the Middle Atlantic States to learn to read the meaning of A. quadrimaculatus catches in the electric light traps in terms of the density of A. quadrimaculatus fauna on the wing and the density of the breeding from which that fauna comes, it is not thought possible to determine the relation of that fauna to the prevalence of malaria. The correlation of the density of A. quadrimaculatus fauna to the prevalence of malaria can probably be determined only in areas where that disease is endemic. These plans, therefore, are designed to determine the former correlations and not the latter.

Size and Nature of Area

The first point in these plans is to select a sized area over which to make the study. After this question a good deal of consideration and discussion, it is suggested that an area of one square is sufficiently large to give reliable data and the same time sufficiently small to be compassed by a reasonable time and energy. The center of this square should be a fairly large, and more important, a well established breeding place of Anopheles quadrimaculatus. This area of one square mile should be carefully plotted with all water accumulations, streams, roads, buildings, woodlands, pastures and cultivated lands which it covers. Arrangements should be made to collect weather data covering temperatures, rainfall, humidity and wind direction and intensity.

Procedure

An electric light trap should be mounted in the standard fashion, should be planted at a distance of about 100 feet from the breeding pool with a clear space around it and should be so set as to be protected from strong winds. This trap should go in operation every evening about seven o'clock, Eastern War Time, and should continue until seven o'clock the following morning, Eastern War Time. All mosquitoes caught should be collected from the trap daily in the forenoon and identified. The trap should run throughout the season.

At least two nail keg traps should be planted on opposite sides in a similar location but separated from the light trap and each other by about 100 feet. Both nail keg traps should be examined each forenoon. In one the mosquitoes should be determined and counted but not retained. In the other the mosquitoes should be killed, determined and counted. It is thought that hydrocyanic acid gas should be used for the killing. A large open-mouthed glass container charged with calcium cyanide can

be inserted in the nail keg where the mosquitoes are to be killed. Killing will be prompt and the gas will quickly disappear. These nail keg traps should run every day throughout the season.

Buildings and structures suitable for roosting for feeding should be selected. Collecting places in them should be determined and density of A. Quadrimaculatus in each of these collection places made

Once each week the entire square mile area should be searched for mosquito breeding, especially, but solely, for A. quadrimaculatus. A standard procedure of dipping for quantitative determination of mosquito breeding with especial reference to A. quadrimaculatus breeding should be devised and adopted. These weekly quantitative summaries of mosquito breeding for the different water accumulations of the square mile area should be carried out throughout the breeding season.

Data Secured

At the close of the season's study for this square mile area we should have a record of all mosquitoes caught in the electric light trap, all mosquitoes taken in the nail keg traps, the density of quadrimaculatus in buildings and structures which had been selected suitable for roosting and feeding, and the density of mosquito breeding, with especial reference to Anopheles quadrimaculatus.

As the study proceeds, the mind of the thought operator will be intrigued by questions, the answers to which he does not know and unless fully realizing that changes are dangerous and have repercussions in various directions, he might be led to make such changes in procedure as to destroy the possibility of correlation at the end of the season. The operator

It, therefore, be very slow to make changes in his original plan and should make them only after having given them a most thorough examination.

General Comments

It is hoped that there will be at least four such square mile units under study in the State of New Jersey during the season of 1942. It is understood that Dr. L. L. Williams has planned a very extensive study of these regions in the southeastern states and that he will accumulate a very large amount of data. It is understood that Dr. Williams has secured the services of Dr. H. Bradley of the Bureau of Entomology and Plant Quarantine for organizing and carrying out this study. It is hoped that at some other points in this country where malaria mosquitoes are prevalent similar studies will be undertaken. Finally, it is hoped that all new information obtained in this study can be brought together in a symposium at the next annual meeting of the New Jersey Mosquito Extermination Association.