

of structures on salt marshes that would fill the place that barns now do, would attract the Barn Swallow (Hirundo erythrogaster) in sufficient quantities to make a difference in the numbers of mosquitoes. The Purple Martin (Progne subis) is a beautiful bird, with a melodious voice and an appetite for mosquitoes. Before the introduction of the English Sparrow it was common in the northern states. When the Sparrow arrived in this country, it became rare. It became still rarer with the advent of the Starling. It seems to me that martin boxes erected in the middle of a salt marsh would be unlikely to be troubled by sparrows. By such a means we might help in mosquito control, and also aid in increasing a beautiful and valuable bird.

Mr. H. H. Stage, Bureau of Entomology and
Plant Quarantine, U. S.
Department of Agriculture,
Washington, D. C.

presented a talk on the subject "The Relationship of Mosquito Control to the War Effort".

U. S. ARMY

Mr. Stage reported that mosquito control work had begun by the Army in the fall of 1940, after Colonel Hardenbergh and several of his associates had made an extended preliminary survey of the mosquito control needs at 151 stations and reservations in the Fourth and Eighth Corps Areas. The work strongly emphasized the control of malaria carrying species of mosquitoes. It was generally organized on the basis of spraying units consisting of 3 men with a supervisor, and brushing and ditching crews composed of 15 men and a supervisor. The effectiveness of the work is illustrated by comparing statistics of 1917 when the malaria case rate in the army was 7.5 per 1000 with 1941 when the rate was 1.8 per 1000. The spraying was begun in April,

It is felt that this early start helped greatly in obtaining the gratifying results indicated above, by destroying the first broods of anopheline mosquitoes. All, over 530,000 gals. of oil were used, as well as 1,000 gals. of pyrethrum and phenol larvicides and 1,000 pounds of Paris green. There seemed to be little difference in the results obtained with the various larvicides. The malaria rate was held very low up to the extended field maneuvers of October, after which a peak occurred. Total costs of all work done amounted to about \$1,500,000.

It is believed that an increase in the number of trained entomologists and sanitary engineers available for service in the Army reservations would be highly desirable.

Mr. Stage also quoted Colonel Hardenburgh as saying that the combination of an entomologist and a sanitary engineer at each station was in large measure responsible for what the Army considered a successful season of malaria reduction.

Probably the most satisfactory way to protect the soldiers when on duty in tropic countries would be to attack the mosquitoes in the adult stage by spraying buildings and barracks with such materials as aerosols or attacking the larvae with spray materials, by protecting the soldiers from mosquito bites as far as possible, and by the use of quinine or other drugs.

U. S. NAVY

The Navy is not doing as much mosquito control work as the Army. There has not, however, been a large amount of malaria in the Navy in recent years. In 1917 there were 8.33 cases per 1000, in 1918 - 5.36, in 1919 - 5.64, in 1920 - 23.11. In 1938 there was a rate of 1.21, in 1939 - 0.85 and in 1940 - 1.19. At one large base in the southeast the 1941 rate was 0.6. At the

same time, the civilian rate outside the base was 5 as great. At that station a mosquito control crew averaging 20 men was kept at work and installed mosquito control drainage on 780 acres of marsh, including 41,000 linear ft. of dragline ditching, and 77,000 ft. of hand ditching.

At another large base, 30 men drained 151 acres of swamp by installing 22,000 linear ft. of hand ditching and 21,000 linear ft. of dynamite ditching.

United States Public Health Service

The United States Public Health Service is responsible for malaria control in the areas immediately outside the reservations of the armed forces, and over a year ago the Service received a considerable fund with which to do extra-cantonment work, including work against mosquitoes and the dog fly. This agency has a number of entomologists and sanitary engineers working and a large program of malaria mosquito control is under way in the southern states.

The Service also has the responsibility of preventing the entrance of mosquitoes by aeroplane, at the various points of entry. The aerosol spray cylinder, with which an aeroplane can be treated with 30 seconds of spraying, has been demonstrated to them, and will probably replace the more bulky spraying apparatus that has been used previously in spraying aeroplanes.

Bureau of Entomology and Plant Quarantine

The Bureau has streamlined its research program as much as possible, and no new research will be begun for the present except as it is directly concerned with the war. Mr. W. G. Bruce of the Department has been appointed as a Liaison Officer to maintain close relations with the Army and Navy on common insect problems.

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