ACTIVITIES IN MEMBER STATES

SOME HIGHLIGHTS OF THE 30TH ANNUAL MEETING N. J. MOSQUITO EXTERMINATION ASSOCIATION

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The following notes, taken from the Proceedings now being set into type, recall some of the statements and discussions that aroused special interest. They do not necessarily represent the most important. No attempt has been made to pass such judgment. The complete facts are to be found in the Proceedings themselves.

L. L. Williams, Jr. pointed out that even the experienced malariol-

ogist cannot set a figure for the population of anopheline carriers which would indicate a malaria hazard. Granted that anopheline and human carriers are present, the seriousness of the hazard depends further upon the screening habits of the human population, their outdoor activity after sundown, the use of killing sprays indoors, and the longevity of the mosquitoes.

G. H. Bradley, in discussing methods of measuring density of **Anopheles quadrimaculatus,** concluded that: "the most satisfactory index to the density of adult **quadrimaculatus** in the South is furnished by the use of natural resting places. Artificial resting places such as boxes and kegs and the use of light traps are of value in obtaining **quadrimaculatus** indices where natural resting places cannot be found. Also, a light trap should always be operated, if possible, in a control area in order to gain an idea of the pest mosquito problem so that explanations of annoyance can be given to the many persons who doubt that **quadrimaculatus** control is efficient merely because annoyance from other mosquitoes continues after **quadrimaculatus** control is achieved."

C. B. Huffaker reported that out of eight methods for trapping mosquitoes, the five least selective (i.e., most likely to reveal the true proportions of each species) gave results corresponding very closely to those attained with the New Jersey trap using no attractant. The author feels that the New Jersey trap without attractant furnishes a means of determining factors by which catches made with other traps can be converted into data more closely representing the actual mosquito population.

L. T. Coggeshall described large-scale intensive malarial infection among military and airline personnel in parts of Africa. By thorough and persistent use of the known control methods, it was demonstrated that malaria could be eliminated. In this region, malaria was the outstanding medical problem of the airline. Without efficient control methods it can bring all activity to a standstill.

Colonel William A. Hardenbergh gave statistics on the control of malaria in the Army:

"The results obtained were good during 1941, when the malaria rate for troops in the continental United States was 1.8 per 1,000 per year. This compared with 2.3 for the 10-year peacetime average, 1931-1940, and with the rate of 7.50 for 1917, which in some ways was a comparable year, so far as the Army is concerned. In 1942, the malaria rate for troops in the continental United States fell to 0.65 per 1,000 per year—the lowest rate the Army has ever had, in peace or in war. In comparing this rate with the rate for 1917 and 1918, it must be remembered that the civilian malaria rates today are much lower than during World War I—probably about one-third as great. In comparison with the 1931-1940 peacetime rate for the Army, consideration must be given to the fact that a definitely higher proportion of our troops are now stationed in malarial areas.

"Although malaria incidence throughout the country may be at a low ebb, the Army's 1942 rate is the result of careful and conscientious

work on the part of all Army personnel concerned—Service Command and post medical officers, sanitary engineers and entomologists—and of the U. S. Public Health Service, and State and local organizations."

D. P. Curry presented a human-interest record of 25 years' work in directing mosquito control operations at Panama Canal.

R. L. Vannote laid down a general guiding principle for civil control organizations. "Closely associated with mosquito-control work within a reservation is the problem of regional control. It is unusual when the two can be divorced. Therefore, the problem of control becomes complicated as to organization and finance as one party can seldom perform both functions. . . . It seems wise to permit the Federal agencies to administer the functions of finance, detail engineering, employment, and detail supervision of personnel and equipment. In this way the broader functions of the job are administered by those most capable of meeting the requirements of organization, which in war time often plays a part equal in importance to the work accomplished. As a rule, I think our county mosquito-control units have felt the job was entirely theirs; that is, on approval of a general plan, funds would be provided to permit the local unit to engage or receive men and equipment from Federal sources and then proceed to perform the work outlined in the general plan as they would a county-financed program. Unfortunately, the military and other Federal agencies are not geared to such a procedure. . . . Therefore, it would seem that the local or county mosquito-control unit has one major function to perform, that is, preparing the master plan of work necessary within the reservation and in the marginal ring. This function should be insisted upon because maintenance becomes a county obligation after the emergency. When this plan has been prepared and accepted by those responsible for the financing and operation, the work should be pursued under the general advice, approval, and over-all supervision of the county unit."

H. H. Stage stated that investigators in the Bureau of Entomology and Plant Quarantine have produced a larvicide "completely effective against anopheline larvae for several days when applied at the rate of 0.1 pound per acre of water surface." Three repellent materials were selected out of more than 700 as effective for several hours under field conditions involving heat and rain. Variation in repugnance to different insects and different species of the same insect was recorded. The identity of the materials has not been revealed because of military reasons. **Culex tarsalis Coq.** was found to be an important vector of sleeping sickness in man and animals.

It is impossible to summarize briefly the review of literature compiled by Bishopp and Stage. The information under a single subheading will be quoted here for its own value and as an indicator to new mosquito workers of the way in which this review of world-wide mosquito work is prepared.

Encephalitis. "A series of four papers on mosquitoes and encephalitis in the Yakima Valley, Wash., appeared in volume 70, number 3, of the Journal of Infectious Diseases. The first paper, by W. McD. Hammon,

W. C. Reeves, B. Brookman, and E. M. Izumi, is entitled "Arthropods Tested and Recovery of Western Equine and St. Louis Viruses from Culex tarsalis Coq." During the four-month period, May 15-Sept. 15, 1941, they report collecting over 15,000 living arthropods for inoculating laboratory animals for the purpose of virus isolation. Of these over 12,000 were mosquitoes. From Culex tarsalis mosquitoes only, three strains of St. Louis encephalitis virus and five strains of western equine encephalomyelitis virus were isolated. During the 41 days when all the infested mosquitoes were caught, at least one of every 386 C. tarsalis was infested.

"The second paper, by W. McD. Hammon, W. C. Reeves, and E. M. Izumi, discussed methods of obtaining suitable live specimens and identification of certain arthropods for virus isolation. Centrifugation of suspensions at 16,000-18,000 r.p.m in an angle centrifuge was found most satisfactory in preparing an inoculum from arthropod specimens. For the isolation of both viruses an intracerebral inoculation of five Swiss mice was proved more satisfactory than an inoculation of one guinea pig or two chick embryos.

"Precipitin tests demonstrated that Culex tarsalis feeds in nature on cattle, horses, man, swine, dogs, chickens, and sheep. This information was reported in the third paper, which was by Frederick Bang and W. C. Reeves.

"The last paper, by W. McD. Hammon, W. C. Reeves, B. Brookman, and C. M. Gjullin, summarized the case against Culex tarsalis as a vector of the St. Louis and western equine viruses. From the evidence reviewed it seems probable that this mosquito has been the most important vector of western equine and St. Louis encephalitis viruses in the Yakima Valley.

"W. C. Reeves, W. McD. Hammon, and E. M. Izumi were successful, in three out of four experiments, in transmitting St. Louis encephalitis virus by feeding Culex pipiens on a 10-percent brain suspension of the virus in 5-percent sheep serum infusion broth mixed with equal parts of whole defibrinated rabbit blood.

"In a paper entitled "Culex tarsalis a Proven Vector of St. Louis Encephalitis" (Proc. Soc. Exp. Biol. and Med., Oct. 1942), W. McD. Hammon and W. C. Reeves conclude that this mosquito has been demonstrated to be infected in nature with virus of the St. Louis strain and to be capable of transmitting it. Furthermore, this species fits well into the epidemiological picture encountered in the Yakima Valley, Wash. This is the first instance, they say, in which a mosquito has fulfilled these three criteria for incrimination as a vector in respect to St. Louis encephalitis virus. Culex coronator Beyer was also determined as a transmitter in the laboratory. Their experiments also demonstrated that the chicken may serve as a satisfactory reservoir of virus."

T. D. Mulhern reviewed the general, statewide mosquito conditions for 1943 and those conditions of particular importance in individual counties. The year's trapping record involving 89 standard New Jersey

light traps shows a total of more than 400,000 identified mosquitoes. Special mention, supported by trap records, is made of the very successful mosquito control maintained by Fort Dix.

R. J. VanDerwerker reviewed the methods available for handling peak-load breeding. Spraying with larvicide has been found inadequate in North Jersey for peak-load control, even in a year (1936) when there was only one peak-load. It becomes necessary to map in advance the areas and depressions which cause breeding only during prolonged wet periods, so that they may be attacked swiftly in peak-load times. The periods of the year which are especially suitable for this mapping are pointed out. In addition to this, it is necessary to have a "master-plan" for a long time ahead so that all opportunities may be utilized to eliminate permanently these peak-load breeding spots. Flood control and the disadvantages of diked marshes were also discussed.

With a witty introduction that will be remembered by many as one of the bright spots of the session, Mrs. Palmer M. Way presented the viewpoint of the New Jersey Women's Clubs. An up-to-the-minute remark was, "Today when the subject of hours of lost manpower is uppermost, isn't it fitting to consider that in the Victory Garden of 1943, in many places in New Jersey, many an hour of manpower will be lost due to the invading hordes of **Aedes sollicitans** or **sylvestris**?"

A history of mosquito control in Middlesex County (New Jersey) by Tiedjens, Smith, and Thom reveals a number of interesting facts not the least of which is, "In 1920, over two hundred cases of malaria occurred in New Brunswick." [At that time New Brunswick had a population of 32,779.—Ed.]

T. J. Headlee summarized ten years of trapping records with the following conclusions:

"1. **Aedes sollicitans, Culex pipiens** and **Aedes vexans** compose 90.1% of the total number of mosquitoes trapped in the ten year period.

"2. Production of **sollicitans** on the salt marshes of northeastern New Jersey has been reduced to so low a point that this species is a relatively unimportant member of the northeastern New Jersey mosquito fauna.

"3. **Sollicitans** continues from Monmouth County south to be the most numerous species.

"4. **Pipiens** is the outstanding species in northeastern New Jersey wherever population wastes are present in concentrations. It is reduced wherever special attention has been given to it and it shows large and sometimes greatly increased numbers wherever gauges have been set adjacent to waters polluted with human wastes.

"5. **Vexans** is the flood water mosquito in New Jersey. Wherever flood water conditions exist during the appropriate summer season this species occurs in large numbers.

"6. **Anopheles quadrimaculatus** is not a comparatively numerous species within this State but it is sporadically present throughout. There are special favorable conditions for its breeding and it occurs in such

spots in comparatively large numbers. As a pest mosquito it is unimportant but as a vector of malaria its importance is great.

"7. The rest of the species which were trapped, amounting to 27, occur sporadically in various parts of the State but most of them occur in their greatest number in the northeastern section of New Jersey. Behind this factor of distribution lies the difference between clay soils and sandy soils. The clay soils of northern New Jersey, under heavy rainfall conditions, offer a very wide variety of breeding places and consequently propagate a wide variety of mosquitoes. The sandy soils of southern New Jersey, by reason of their ready absorption of rainfall, provide a much more limited and more uniform set of breeding conditions and consequently the number of mosquito species produced under these conditions is reduced."

J. M. Ginsburg described various methods and apparatus for producing and applying aerosol sprays, in killing and repelling adult mosquitoes as well as other insects. The chemical and physical properties of aerosols in general were discussed from a practical viewpoint.

The session was attended by a total of 125 mosquito workers of which 33 were from the military and Public Health Service personnel. Judging from comments heard here and there, this year's meeting was considered particularly interesting and informative. It is anticipated that the complete Proceedings will be mailed out during the month of June.