

slightly favored the oil alone. Larvae of *Aedes pseudoscutellaris* and *Culex fatigans* were introduced into two drums halved lengthwise. One was placed in the open and the other under a roof. They were sprayed with 2 cc. of a 5 per cent solution of DDT in a non-volatile mineral oil. A week later all in the exposed drum were alive and all in the sheltered one were dead. The 14.52 inches of rain which fell during the period overflowed the exposed drum, carrying away the larvicide. In a subsequent test no eggs were deposited for seven weeks in the drum which had been oiled, whereas in the drum treated with oil plus DDT none were found for 12 weeks. A 5 per cent oil solution of DDT was tried with success against *Culex fatigans* in an airraid shelter and in a pool infested with this species and *C. annulirostris*. DDT was also found effective as a dust (1 part DDT to 9 parts soapstone) on part of the latter breeding area. The author concludes that DDT is suitable as a larvicide under Fiji conditions where an annual rainfall of 120 inches occurs.—F. C. Bishopp.

**SPRAY-KILLING OF MOSQUITOES IN HOUSES—A CONTRIBUTION TO MALARIA CONTROL ON THE GOLD COAST.** By L. G. Edey. Trans. Roy. Soc. Trop. Med. and Hyg. 38 pp. 167-188 with discussion pp. 188-197. November 29, 1944.

The war made necessary a serious consideration of malaria control in the native port village of Takoradi, where suddenly in 1941 large numbers of Europeans began to arrive. To supplement more prompt control operations a test was carried out with a number of spray-formulas applied to the interiors of the houses. *Anopheles gambiae* constituted the principal local vector of malaria. *A. funestus*, an effective carrier, was recorded occasionally and a few other species were met with rarely. Dissections indicated a malaria rate among *A. gambiae* of 3 per cent. The treatments used consisted of pyrethrum dust at the rate of 0.35-2 oz. per thousand cubic feet, pyrethrum-kerosene, cresol-kerosene, and pyrethrum-aerosol. Pyrethrum-aerosol proved to be the insecticide of choice, with pyrethrum-kerosene next best in order of labor economy. Each of these methods, however, appeared to be satisfactory from the standpoint of mosquito kill. There appeared to be a marked lowering of malaria morbidity rates especially among the Europeans, although the precise effect of the spraying operations could not be differentiated from the results of the general malaria control efforts.—F. C. Bishopp.

**OBSERVATIONS ON *Anopheles gambiae* AND OTHER MOSQUITOES AT WADI HALFA.** By D. J. Lewis. Trans. Roy. Soc. Trop. Med. & Hyg. Vol. 38, No. 3, pp. 215-229, Dec., 1944.

Observations are recorded on *Anopheles gambiae* and other mosquitoes at Wadi Halfa, Sudan, especially from the standpoint of the zoogeographic position of the area. Much importance is attached to maintaining a barrier between the Sudan, where this dangerous malaria carrier occurs

normally, and Egypt where the species has appeared recently and from which it may be eliminated. The author presents an interesting account of the Wadi Halfa area of the Nile and of the climate and other conditions as influencing mosquito distribution and breeding.

Eight of the 22 species recorded for Egypt and the Sudan are present in Wadi Halfa—3 *Anopheles*, 3 *Culex*, an *Aedes* and a *Theobaldia*. *A. gambiae* is by far the most important species and paris green, oiling, grading and filling are employed in its control. Paris green, 1 per cent in Nile silt, is distributed by hand. In the Faraf basin and canal *Gambusia holdbrooki* is a useful control agent. The other two *Anopheles*—*multicolor* and *pharvensis*—were controlled by the measures employed and the other species except *C. pipiens* are unimportant as pests of man.—Fred C. Bishopp.

**DR. F. C. BISHOPP DELIVERS HERMAN M. BIGGS MEMORIAL LECTURE.** At the invitation of the New York Academy of Medicine, Dr. Fred C. Bishopp, Assistant Chief in Charge of Research, U. S. Bureau of Entomology and Plant Quarantine, delivered the Herman M. Biggs Memorial Lecture before a distinguished group of medical men and others in the Academy Auditorium (New York City) on April 5, 1945. The title of Dr. Bishopp's lecture was "The Medical and Public Health Importance of the Insecticide DDT." This was the twelfth annual Biggs lecture and the first delivered by a scientist not of the medical profession.

H. H. Stage.

**FORMULATION OF DDT SPRAYS AND DUSTS.**<sup>1</sup> By R. D. Chisholm, U. S. Department of Agriculture, Agriculture Research Administration, Bureau of Entomology and Plant Quarantine.

A survey was made of the methods used by many Federal and State investigators in the formulation of DDT sprays and dusts. Attention was called to the patented status of DDT, and to the need for the consideration of the legal phases before formulation suggestions are used commercially. The form of DDT used for general agricultural purposes is known as "technical DDT" and is specified to have a setting point not lower than 88° C. Mixtures of DDT and a diluent, such as talc or pyrophyllite, containing up to 50 per cent of DDT may be ground, provided that care is exercised to avoid overheating the mill. More concentrated mixtures do not have desirable physical properties. Ground mixtures are difficult to wet and require vigorous agitation or a wetting agent to maintain uniform suspension in the spray tank. The use of a minimum of wetting agent was suggested to avoid excessive run off. Various other methods of formulation were suggested, such as

<sup>1</sup>Read at the joint meetings of the American Association of Economic Entomologists and the Entomological Society of America at New York City, December 13-15, 1944.

suspensions resulting from the addition of solutions of DDT in water-miscible solvents to water, solutions for direct application, emulsion of solutions of DDT in various water-insoluble solvents, and dusts. Attention was called to the possible catalytic decomposition which may result from the presence of iron and iron oxides and other anhydrous metallic chlorides. Most of the common insecticides with the exception of pure nicotine do not cause decomposition. Most of the solvents inhibit the catalytic decomposition reaction. Some biological tests have indicated that some insecticides or fungicides, such as lime-sulfur or bordeaux mixture, have reduced the period of effectiveness of DDT sprays. Whether this reduction is of chemical or physical nature has not been established. A loss of DDT from deposits on glass plates exposed in direct sunlight was observed. The value of standardized mixtures for experimental purposes was suggested.

50362

Author's Abstract.

SOME PRACTICAL SUGGESTIONS FOR THE REARING OF *Aedes aegypti* (Linn.). By Helen Louise Trembley. Proceedings of the Thirty-first Annual Meeting of the New Jersey Mosquito Extermination Association, pp. 168-172.

The author describes the technique employed by her for rearing *Aedes aegypti*, of which about 1,200 adult females are required each week for work at the laboratories of the Division of Physiology, National Institute of Health, U. S. Public Health Service, Bethesda, Maryland.

She tells how, in year round maintenance of adequate colonies of the insect, the egg are produced in quantities; how they are "conditioned" and manipulated to assure a maximum hatch; how the larvae, pupae, and adults are cared for; and how the adults are manipulated, both in experimental and therapeutic use, and in the production of eggs for continuation of the stock colonies of mosquitoes.

R. D. G.

9470

THE BREEDING OF THE SALT-MARSH MOSQUITO IN MIDWESTERN STATES. By Hermann L. Fellton, Journal of Economic Entomology, vol. 37, pp. 245-247.

This article reports the salt-marsh mosquito *Aedes sollicitans* to have been occasionally troublesome as a result of breeding in the outflow from salt springs, salt wells, oil wells, and from coal mines, at many places in Indiana, Illinois, Missouri, Arkansas, Oklahoma, New Mexico, Arizona and other States. Notes on *Aedes cantator*, *A. dorsalis* and *A. taeniorhynchus* are included.

R. D. G.

50355

*Anopheles quadrimaculatus* IN NORTHEASTERN UNITED STATES. By Ralph C. Barnes and Herman L. Fellton. Proceedings of the thirty-first Annual Meeting of the New Jersey Mosquito Extermination Commission, 1944, pp. 48-51.

This important vector of malaria "... is now reported from all of the Northeastern States except

Vermont, and its occurrence in that State seems most probable." This paper then gives detailed records of recent inspections in the neighborhood of war establishments.

R. D. G.

THE PLAN OF OPERATION FOR THE NORTHEASTERN DIVISION OF THE MALARIA CONTROL IN WAR AREAS OFFICE OF THE U. S. PUBLIC HEALTH SERVICE. By Herman L. Fellton and Ralph C. Barnes. Proceedings of the Thirty-first Annual Meeting of the New Jersey Mosquito Association, pp. 45-47.

Malaria is continuously present (is endemic) in many of our southern states. While formerly prevalent in many parts of the northern United States, it has almost completely vanished from that section in recent years. In consequence, the malaria control work performed by the Public Health Service, with headquarters at Atlanta, Georgia, had been very largely restricted to 20 southern states where it is complimentary to the control work performed by the Army and Navy within the boundaries of military reservations.

Army, Navy, Coast Guard and Merchant Marine personnel returning from malarious areas overseas; the introduction of prisoners of war; and the widespread transfer of personnel between malarious and non-malarious areas presents a special hazard for our non-malarious regions where, nevertheless, malaria carrying mosquitoes may be rather generally present and sometimes locally abundant.

Prompted by this hazard of possible local epidemics in non-endemic areas, the Surgeons General of the Army and of Public Health decided that steps should be taken to guard against it. Surgeon General Thomas Parran has described the situation in the following words: "Inevitably malaria cases will be dispersed through the United States by returning troops. Local outbreaks are probable in parts of the country like the Upper Mississippi or the Hudson Valley, which have malaria mosquitoes, but which have been free from infection for many years. However, it is believed that history will repeat itself and that such outbreaks will die out, because, as in the past, the environment is not favorable to perpetuating the infection. But we should accelerate nature's process with mobile control forces to deal with outbreaks in any area."

The paper then directs attention to local outbreaks of malaria which have occurred in non-endemic areas, such as those at Camden, New Jersey, in northern Ohio, in eastern Iowa, and in southern Minnesota; Terre Haute, Indiana, had several hundred cases in 1938. One small town in Illinois had 53 cases in 1943.

At first, the Malaria Control in War Areas program was limited to work within a one-mile zone around military and essential industrial establishments within the endemic area, and was designed to guard against the transmission of malaria from infected civilians to military and essential industrial personnel.

More recently this has been extended to certain non-endemic areas for the purpose of pre-