semanas después de aplicado y su eficacia en evitar la oviposición perduraba unas 6 semanas. Se controló el *Melophagus ovinus* por medio de imersiones de las ovejas o con rociarlas con emulsiones o suspensiones de DDT al 0.2 hasta 0.25 por ciento. Las pulgas en zorras se controlaron durante 3 meses con una sola aplicación de polvo al 10 por ciento. Las rociadas residuales aplicadas a edificios infestados dieron un control satisfactorio, como también aplicaciones de 8 onzas de polvo al 10 por ciento para cada 1000 pies cuadrados. Tanto los rociados residuales como las aplicaciones de polvo controlarán las chinches en los gallineros. Los piojos, tanto chupadores como mordedores, en animales domésticos, se controlan con pulverizaciones secas de DDT o por imersión. Se describe el procedimiento a usarse en cada tipo de animal y se hace referencia a la ineficacia relativa contra los ácaros.—Translation of a review in English by B. V. Travis.

28662 Ca

OBSERVATIONS ON THE NIGHT-TIME RESTING AND BITING HABITS OF ANOPHELES MOSQUITOES IN DDT TREATED AND UNTREATED BUILDINGS. Clarence M. Tarzwell and Frank W. Fisk. (U.S.P.H.S., Communicable Disease Center, Technical Development Division, Savannah, Ga.) Pub. Health Rep. 62(3):84–94. 2 fig. 1947. (Abstract.)

Studies of the night-time behavior and resting habits of anopheline mosquitoes were conducted in rooms to which wild mosquitoes had free access and the walls and ceilings of which were marked off into numbered squares to facilitate counting and recording. At regular intervals the positions of all mosquitoes were plotted on scale drawings of the walls and ceiling, the species, sex and resting time being shown for each mosquito. An analysis of the data showed that *Anopheles quadrimaculatus* which entered the building to feed on the bait animal rested on the walls and ceiling for considerable periods before as well as after feeding. The resting period of the females varied from a few minutes to over 11 hours and there was no significant difference between the means for unengorged and engorged mosquitoes, being 167±3 minutes for the former and 170±minutes for the latter. After treatment, their resting period varied from a few to 90 minutes averaging 40±3 minutes for the unengorged and 33±4 minutes for the engorged. After treatment, 31 per cent of the *A. quadrimaculatus* resting on the walls were engorged females whereas before treatment only 14 per cent were engorged females. It is probable many of the unengorged mosquitoes were irritated by the DDT and left before attempting to bite. Before treatment the number of *A. quadrimaculatus* females increased throughout the night, reaching a maximum about an hour before daylight while after treatment the largest number was present just after the influx at dusk and only a small number were present at any time during the remainder of the night.—C. M. TARZWELL.

9551 Ca

CONTROL OF ANOPHELINE MOSQUITO LARVAE BY USE OF DDT-OIL MISTS. Frederick F. Ferguson, Earl H. Arnold, and William M. Upholt. (Communicable Disease Center, Technical Development Division, U.S.P.H.S.) Public Health Reports, Vol. 62(9):296–302. 1947. (Abstract.)

Initial tests with DDT as a larvicide were with aqueous emulsions at total rates similar to those used for oil sprays. It was soon found, however, that when uniformly distributed, a gallon per acre of a No. 2 fuel-oil-DDT solution containing 0.5 per cent of a good spreader gave adequate control. This larvicidal material may be prepared by adding 2½ pounds of DDT and 1 quart of spreader to a 50 gallon drum of No. 2 fuel oil. For the application of this solution at 1 gallon per acre, small air-pressure hand sprayers fitted with mist or atomizing nozzles [Spraying Systems Co., 1/4LN 2.55; Marley Co., Inc., 1H41; Monarch Mfg. Co., No. 5, or equal] were satisfactory. When operated at pressures between 50 and 30 psi, these nozzles gave a discharge of 3 gph and droplet sizes of 70 to 220 microns. In operation, the sprayer was charged with 1 gallon of solution; and the vaporous oil mist was drifted with the wind, an effective swath width of 30 feet being obtained under normal conditions. Comparative field tests at equal dosages of DDT per acre indicated that oil mists at a gallon per acre were about as effective for mosquito control as emulsions applied at rates of 15 gallons per acre. Further, due to great reductions in material used and labor required, oil-mist larvicides are much cheaper than oil sprays and significantly less costly than DDT or paris-green dusts. All larval instars were susceptible to the mist spray.—C. M. TARZWELL.

19086 Ca

COMPARATIVE STUDIES OF DDT DUSTS, DDT-OIL SPRAYS AND PARIS-GREEN DUSTS USED ROUTINELY IN ANOPHELINE LARVA CONTROL. Willis V. Mathis, Frederick F. Ferguson, and S. W. Simmons. (U.S.P.H.S., Communicable Disease Center, Technical Development Division, Savannah, Ga.) Pub. Health Rep. 62(3):95–102. 1947. (Abstract.)

Evaluations have been made of anopheline larvicides when used in a general malaria-control program. DDT was used in fuel oil emulsion, in undiluted fuel oil and in dusts at the rate of approximately 0.1 pound per acre. Paris green was used in a dust at the rate of approximately 1 pound per acre. Comparative cost of the different materials and man-hours required to apply each to a given area was determined. DDT-fuel oil used as an emulsion or undiluted spray (1 gallon of solution per acre) gave a higher degree of control than did paris-green or DDT dusts. Data from the control-operations records showed that the undiluted DDT-fuel oil

spray is more economical than other larvicides used, both as to the material cost and man-hours required to treat a given area.—W. V. MATHIS.

17983 Ca

THE CONTROL OF RAT ECTOPARASITES WITH DDT. Russell G. Ludwig and H. Page Nicholson. (U.S.P.H.S., Communicable Disease Center, Technical Development Division, Savannah, Ga.) Pub. Health Rep. 62(3):77–84. 8 fig. 1947. (Abstract.)

Field studies to determine the effectiveness of a 10 per cent DDT, 90 per cent pyrophyllite dust mixture for rat ectoparasite control and to develop equipment and methods for its application were undertaken at Savannah, Georgia, in 1945. Extensive inspections were made and representative establishments having heavy infestations of rats and their ectoparasites were chosen for check and treatment, previous care being used to have similar types of buildings in each group. Live trapping was carried out in all buildings before treatment and at intervals after treatment to establish ectoparasite indices and the normal variation of ectoparasite populations so the results of treatment could be evaluated. Treatment was effected by blowing the 10 per cent DDT dust into burrows and enclosed harborages with a cyanogas foot pump duster, and by applying a layer of dust, with hand shaker dusters, along runways and around holes where it would be picked up by the rats and carried to nests and harborage areas. An average of 8 pounds of dust was used for each establishment. Of the 10 species of ectoparasites found on rats in Savannah, only *X. cheopis* was found in sufficient numbers and uniformity of distribution to permit an analysis of seasonal population variations. Consistent control of *X. cheopis* was obtained in all establishments with control percentages dropping off from an initial of 99.3 per cent by approximately 5 per cent per month for 4 months following treatment.—C. M. TARZWELL.

0737 Ca

THE CONTROL OF HOUSE FLIES BY DDT SPRAYS. W. C. Baker, H. I. Scudder, and E. L. Guy. (U.S.P.H.S., Communicable Disease Center, Technical Development Division, Savannah, Ga.) Pub. Health Rep., Vol. 62(17):597–612. 1947. (Abstract.)

Effective control of *Musca domestica* for a period of 3 months was obtained in dairies by spraying both barns and outbuildings with a xylene-*Triton X–100* emulsion containing 2½ per cent DDT applied at the rate of 200 mg. DDT per square foot. A suspension of water-wettable DDT powder gave comparable results. Under poor sanitary conditions treatment of barn or outbuildings only was unsatisfactory. In restaurants effective control for 3 months or more was obtained by spraying ceilings and walls of dining room and kitchen with an emulsion containing 7½ per cent DDT and applied at the rate of 200 mg. DDT per square foot. In small food and ice-cream shops, 40–60 ft. of DDT-impregnated cord was hung as a replacement for electric light pull cords, along the chains of suspended display shelves, and from the kitchen ceiling at locations where the string would not interfere with the employees. Good control was obtained when the fly influx was not excessive. Emulsions containing ½ per cent DDT when applied at the rate of 300 and 200 mg. per square foot as a cover spray gave effective control for 3 weeks of adults emerging from grain wastes and from garbage washings in an alley. When nearby adult resting places were also treated, the control period was lengthened considerably.—W. C. BAKER.

9413 Ca

EXTENDED LABORATORY INVESTIGATIONS OF THE TOXICITY OF DDT RESIDUES TO ADULTS OF *Anopheles quadrimaculatus*. R. W. Fay, S. W. Simmons, and J. M. Clapp. (U.S.P.H.S., Communicable Disease Center, Technical Development Division, Savannah, Ga.) Pub. Health Rep. 62(5):149–158. 1947. (Abstract.)

The residual toxicity of DDT to adult female *A. quadrimaculatus* mosquitoes is lost more rapidly at short exposure periods, i.e. 30 minutes, than at long exposure periods, i.e. 180 minutes. The loss of residual toxicity does not follow a single straight line relationship, but occurs more rapidly during the first 16 weeks and then shows little change for the next 6 months. Direct comparisons of mortalities show the 200 mg. DDT per sq. ft. deposits after 16 weeks to be about equal to the 100 mg. DDT per sq. ft. deposits after 12 weeks. The knock-down rate at the end of 60 min. exposures was a good indication of the 48 hr. mortality. There are indications that DDT in slow volatilizing solvents does not show as marked loss of residual in the first 12 weeks of aging as it does in fast volatilizing solvents. The male mosquitoes are more susceptible to DDT than the female adults.—R. W. FAY.

5788

NOTES ON THE ANOPHELINES OF VENEZUELA AND THEIR IDENTIFICATION. By Pablo Cova Garcia. XII. Conferencia Sanitaria Panamericana, Cuadernos Amarillos No. 1. Publicacion de la Comision Organizadora. 208 pp., 52 unnumbered plates, 42 figs. Editorial Grafolit, Caracas, Venezuela. 1946.

Of the several regional treatments of the Anopheline mosquitoes that have appeared in the past few years, this is one of the best. It combines the best features of a taxonomic and faunistic treatise on the 30 species of Anophelini of Venezuela, with a well-conceived laboratory manual to train public health personnel and students of medical entomology in the identification and handling of these mosquitoes.

The book is very well organized. The eggs, larvae, pupae, adults, and male genitalia are each treated in separate sections, in this order. For the larvae and adults there is a discussion of the morphology and of the biology, followed by a laboratory guide to show students the essential characters necessary for the determina-