are as follows: *A. p. punctulatus,* 53 per cent; *A. annulipes,* 38 per cent; *A. p. farauti,* 23 per cent; and *A. amictus amictus,* 1 per cent.

Taking the above vector qualities into consideration, the Australasian anophelines are placed into the following groups:

Proven dangerous vectors: *Anopheles p. punctulatus* Don. and *A. p. farauti* Lav.

Potential vectors under locally favorable conditions: *A. annulipes* Walk., *A. bancrofti bancrofti* Giles, *A. subpictus* Grassi, *A. amictus hilli* W. and L., and *A. a. amictus* Edw.

Unknown, but at most locally significant: *A. meraukensis* Venh. and *A. novaguenensis* Venh.

The primary vectors of New Guinea and the islands are the races of *Anopheles punctulatus,* the vector of Northeastern Queensland is *Anopheles p. farauti,* and the presumptive vector of sporadic malaria in the South is *Anopheles annulipes.* The vectors of the Northern Territory, however, are still undetermined. No permanent change in the distribution and amount of malaria on the mainland of Australia is expected unless a new vector is introduced. The possibility of introduction of *A. punctulatus punctulatus* into the tropical parts of the mainland cannot be taken lightly.—ROY W. CHAMBERLAIN, The Johns Hopkins University, Baltimore, Md.

THE EXPERIMENTAL USE OF DDT SPRAYS AS MOSQUITO LARVICIDES. By E. H. Arnold, Frederick F. Ferguson, and William M. Upholt (Malaria Control in War Areas, U. S. Public Health Service). Public Health Rpts. Suppl. 186:66–79. 1945.

Studies to determine the usefulness of DDT when substituted in part for fuel oil in anopheline larviciding are reported. Applications were with hand equipment, both compressed air sprayers and knapsack sprayers, and results were checked by dipping for larvae before and after treatment. Several types of application were tried: (1) a tight emulsion of No. 2 fuel oil containing DDT and water; (2) a quick-breaking emulsion of the same type (referred to as surface application); (3) a suspension produced by dissolving the DDT in ethyl alcohol and then diluting with water; and (4) bottom applications obtained by dissolving the DDT in a heavier-than-water solvent. Solvents tested included pine oil, sulfonated pine oil, xylene, kerosene, and a gas condensate liquor, as well as No. 2 fuel oil. In the tight emulsion, *Triton* X-100 was used as emulsifier; and in the quick-breaking emulsions, *B1956* or *Artic Syntex A* was used as emulsifier. *Intracol* was used as a dispersing agent in the alcoholic suspensions.

The bottom application was impractical to apply, but all of the other types of applications resulted in good control of mosquito larvae when applied at the rate of 0.1 pound DDT per acre. No appreciable residual effects were noted at dosages that were not obviously harmful to wildlife. Laboratory evidence supported the field observation that the distribution of the DDT, and thus its toxic action, was limited to the distribution of the solvent.

Further laboratory investigations indicated that one important factor in the failure to obtain residual effectiveness in field application was the inactivation (without decomposition) of the DDT by some factor in the bottom-mud complex.

Limited dosage-mortality and time-mortality studies in the field indicated that good larval control could be obtained with dosages as low as 0.006 pound per acre with some types of application.—W. M. UPHOLT.

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TECHNIQUES AND APPARATUS USED IN EXPERIMENTAL STUDIES ON DDT AS AN INSECTICIDE FOR MOSQUITOES. By S. W. Simmons and Staff (Malaria Control in War Areas, U. S. Public Health Service). Public Health Rpts. Suppl. 186:3–20. 1945.

Window traps can be used for the determination of the subsequent kill of mosquitoes leaving rooms treated with DDT. The greatest difficulty has been experienced in determining effective kills and in keeping the mortality in check cages at a minimum. Humidity, wind, and temperature are factors of outstanding importance in the well-being of mosquitoes held in cages. Mortality due to natural causes or to handling should be kept below 20 per cent. Experiments should be conducted in areas having large mosquito populations in order to secure significant catches in the window cages.

The wall-cage test is a biological method of determining the residual toxicity of treated walls. Insects placed in glass chambers were exposed to treated walls for specific time intervals and then held 48 hours for observation of mortality.

The wall-cage test has been used successfully with both house flies and mosquitoes and undoubtedly could be adapted for testing other insects. The accuracy of the results, particularly when testing mosquitoes, depends to a large extent on the careful handling of the specimens both during and after the test.

A rapid, uniform, accurate, and widely applicable laboratory technique has been devised for testing the effect on adult mosquitoes of spray residues on various surfaces. Panels having a total surface of 1 square foot are fitted into a wooden framework and adult mosquitoes are introduced into the exposure chamber formed by the panels. After known periods of time they are removed and held for 48 hours to determine mortality. Transfer of adult mosquitoes from chambers to cages is accomplished by air currents. Each complete test requires approximately 15 minutes and no injury to mosquitoes or spray residues is evident. Uniform comparable results have been attained in replicated tests and good correlation with field results has been obtained.

The techniques employed in the laboratory test-