marsh land near Cocoa, Florida, at various times of the day over a 24-hour period. Counts were made over complete body of personnel after one minute of immobility in the following typical locations:

a. Laurel tree (good canopy) on road.

b. Palm tree (fair canopy) on road.

c. Middle of bridge (open conditions) over creek.

d. Laurel tree on marsh land but dry under tree.

e—Open pickle weed grounds on marsh land.

f—Mangrove tree (fair canopy) on marsh land with water under it.

Data derived from these counts indicated that:

a. Migration starts about dawn from open into shaded areas, in or about the open marshes, over 1-hour period with the minimum count at 8 A.M. and then increases in the hot sun of late afternoon.

b. Full migration starts about dusk from shaded into open marshes. It should be noted, however, that landing rates of over 100 were obtained during the night in jungle areas.

c. Dawn flights decrease population in the open marshes but not to zero. Fairly high counts obtained in open marshes under bright sunlight.

d. There was increased activity in open marshes before dawn and after dusk.

e. Evidence points to dawn and dusk migration.

f. For practical control, open marshes should be treated in the "predawn" and forested areas after dawn.

Migratory habits of *Anopheles quadrimaculatus* were studied in swamp areas near Decatur, Alabama. The data indicated that:

a. This species is completely inactive during periods of sunlight (resting periods).

b. It does not land or bite under sunlight conditions or when in flight near resting places.

c. Between sunrise and dark, this species rests in some dark, cool, damp place such as a tree hole, hollow log, or empty keg.

d. They leave their resting place during the hour following sunset.

Since the anopheline adults had practically a zero landing rate in the vicinity of their resting places over a 24-hour period, it was concluded that the adults in this particular location have acquired a definite preference for specific locales in which blood meals are daily sought.

It was concluded that control of the adult by aerosol treatment is feasible.

a. During the day while they are resting in tree holes.

b. At dusk when they are leaving tree holes.

c. In early morning when they are returning to tree holes.—LEO KARTMAN, University of Hawaii, Honolulu, T. H.

29429 Ca

BIOLOGICAL CHARACTERISTICS OF LABORATORY-REARED *Aëdes atropalpus*. H. L. Trembley. J. Ec. Ent. 40(2):244–250. 1947.

Aëdes atropalpus, a species of rock-hole mosquito, has been added to that small group of mosquitoes which are autogenous. The females do not require blood meals, or, in fact, any food at all, in order to deposit viable eggs. A colony in which the females were fed only a sugar solution was reared in the laboratory for more than a year, and in its 26th generation continued with no apparent loss of vigor. A colony in which the females received only distilled water for several generations was thriving at the time the article went to press. A comparison of the life-cycles of individuals from the colony routinely offered blood and those denied blood showed no marked differences. The females of this species may be induced to bite when blood meals are offered, but subsequent oviposition results in comparatively few viable eggs. *Aëdes atropalpus* may mate in small spaces, has no seasonal period of comparative inactivity, and does not exhibit a decrease in the number of females with the increase in successive generations.—Author's abstract.

1599

RESISTANCE OF MOSQUITO LARVAE AND PUPAE TO EXPERIMENTAL DROUGHT. George H. Bick and George H. Penn. Ann. Ent. Soc. Am. 40(1):82–86. 1947.

Random field observations in New Guinea showed that numerous late stage anopheline larvae were present in rain puddles which had evaporated to the damp mud stage and subsequently reflooded. Fourth instar larvae of *Anopheles punctulatus* survived approximately 120 hours on damp filter paper flooded for 30 minutes at 24 hour intervals.

Experiments are described which attempted to determine the effects of varying periods of drought and of periodic flooding on the larvae of *Anopheles walkeri*, which breeds in the shady, grassy margins of swamps and lakes; *Aëdes vexans*, which breeds in temporary pools; and *Wyeomyia smithii*, which finds its breeding water in pitcher plants.

Oversized filter paper was placed on the bottoms of petri dishes and sufficient water from the collection source was allowed to dampen the paper without showing a free liquid. Control dishes were flooded to a depth of ¼ inch. Experimental dishes were covered for maximum humidity, and control dishes were kept uncovered. Temperature ranged from 21° C. to 28° C.

Five 4th instar larvae of *Aëdes vexans* were added to each of 30 dishes and examined as follows: 15 each after 24 and 48 hours, and 30 each after 72, 96, 120, and 144 hours of continuous drought. Maximum survival time was 96 hours (17 per cent), while survival at 48 and 72 hours was not significantly different (13 per cent and 17 per cent). Third instar larvae of *A. vexans*, treated as above, gave a maximum survival time of 120 hours (20 per cent) when examined as follows: 30 larvae each after 24, 48, 72, 96, and 120 hours of continuous drought. One dish of 14 first and second instar larvae of