ated with 4th instar larvae of *Aedes abserratus* (Felt and Young) and 1st instar larvae of *Aedes canadensis* (Theobald). The observation and associations of *Aedes decticus* follow those of Smith 1952 in Massachusetts.

During a mosquito survey of Wayne County, also in the Pennsylvania Pocono's, eight 3rd instar larvae of *Aedes diantaeus* Howard, Dyar and Knab were collected from a clear, cold, shaded, semi-permanent pool at the edge of Lake Como, Buckingham Township, Wayne County on June 6, 1967. This collection was mixed with 4th instar *Aedes stimulans* (Walker). A second collection of 4th instar larvae of the same species was taken from the same type of habitat on July 20, 1967 from Rose Pond, Camp Rose Lake, Buckingham Township, Wayne County. These larvae were a lone collection and not associated with any other species. Both collections were deposited in the Entomology Laboratory, Department of Health, Harrisburg.

On June 12, 1965 two female *Aedes grossbecki* Dyar and Knab were submitted to the entomology laboratory in Harrisburg by Mr. Richard Sivel. These adults were taken in a biting collection near New Hope, Solebury Township, Bucks County, Pennsylvania.

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THE SUCCESSFUL INDUCED COPULATION OF *Culiseta melanura* (Coquillett) [1]

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There has been considerable interest in the laboratory colonization of *Culiseta melanura* (Coquillett), due to its incrimination as a possible vector of eastern and western equine encephalomyelitis. A successful colony would allow studies of its biology, and its ability to transmit various disease producing agents. The lack of fertilization of the female has, until now, been one of the most important barriers to successful colonization of *C. melanura*. Modified techniques for maintaining adults plus a preliminary report of successful fertilization through the induced copulation method are presented here.

Larvae were collected at weekly intervals from Pokomoke Cypress Swamp near Pokomoke, Maryland. During the months of December 1966, January and February 1967, 630 larvae were collected and brought into the insectary. The larvae were transferred to white enamel pans along with swamp water, rotted leaves, and peat collected at the larval breeding sites. The rearing pans were kept in a room at a temperature of 80.6°F±1°. Larval food consisted of finely ground monkey chow and sheep pellets. Larval food was replenished whenever necessary. Pans were checked daily for scum and water evaporation. Water level in the pans was maintained by adding tap water (Rutledge and Ward, 1965). As pupation occurred, pupae were picked, transferred to a dark green quart jar and placed in a screen cage of approximately 8 cubic ft. capacity. After emergence, the adults were offered sliced apples and 4 percent solution of sugar water three times weekly. The adults were held in a room with a relative humidity of 76–84 percent and a temperature of 78–80° F. The lighting in this room is controlled by an automation system for insectaries, as described by Levin *et al.* (1958), producing 15 hours of daylight, dawn and dusk.

At first it was extremely difficult to obtain uniform larval development and pupation. The larvae were apparently in a state of diapause, causing pupation to occur slowly and intermittently. However, between December 1966 and late March 1967 a total of 294 pupae were picked with subsequent adult emergence. At first the females were induced to take a blood meal by introducing a human arm into the cage. This procedure was repeated for several days and two females fed. On other occasions, rabbit, guinea pig and chick were used.

An attempt was made to inseminate the two females that fed on humans, by using the artificial mating method described by Yang Ow *et al.* (1963), for maintaining a laboratory colony of *Anopheles maculatus* (Theobald). One female died and the other produced an infertile egg raft. It was observed that if the adults were kept in the dark they fed better on the sugar water solution as evidenced by an abundance of fluid in their abdomen. The cage was darkened by covering the entire structure with black construction paper.

In a later attempt to induce the females to take a blood meal, all of the females were grouped together and placed in a cage, as described by Eldridge and Gould (1960), on top of which a 4–5 day old chick was taped. This cage was kept in the dark on all feeding attempts. Using this

[1] This material has been received by the Office of The Surgeon General, Department of the Army, and there is no objection to its presentation and/or publication. This review does not imply any indorsement of the opinions advanced or any recommendation of such products as may be named.

method, a total of 36 mosquitoes engorged and were force-mated. Of these, 24 produced egg rafts, with a total of 6 hatching. From these six egg rafts a substantial number of first generation (F_1) laboratory reared *C. melanura* adults were obtained. A total of 17 egg rafts have been collected from the F_1 generation, with 8 hatching (45.5 percent hatch rate). At the time of writing over half of the F_1 adults are still alive, and pupation and adult emergence is occurring in the F_2 generation. Even though considerable additional work is required to determine the requirements of this species, colonization is now believed to be possible.

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A SLOW SPEED SPEEDOMETER

A. G. MAC BAIN, ROBERT SUHRBIER, AND EDWARD HOLUB

The Desplaines Valley Mosquito Abatement District, Lyons, Illinois, acknowledges the importance of accuracy in calculating pounds of insecticide per acre and has taken steps to increase efficiency in the calculation of dispensed toxicants.

The general foreman and mechanic adapted a tractor speedometer to a pick-up truck used in the night fogging operation. The advantage of using the Stewart-Warner Tractor Speedometer kit No. 366 A.U. is its low speed registration. This model is calibrated in 2/10 m.p.h. on the speedometer which has a range of 0 to 10 m.p.h. The odometer is calibrated on 1/10 and 1/100 mi. Its primary use is to facilitate control of the slower speed, e.g. maintaining 4 m.p.h., which does not record accurately on the conventional tachometer. It is important to note that the slow speed instrument is used in conjunction with the conventional tachometer.

With a few minor changes in the Stewart-Warner kit and the addition of a microswitch the unit was installed on the front wheel of our pick-up as shown in Figure #1. The small wheel which travels on the tire (the tire representing the ground) is spring-loaded to prevent any possible bounce (Figure #2). When the wheel is engaged and riding on the tire the microswitch activates the small light over the speedometer dial and not only illuminates the dial but also serves as a signal that the speedometer wheel is engaged (Figure #3).

The speedometer has a range from 0 mile per hour to 10 miles per hour. The question immediately arose about speeds in excess of 10 miles per hour and possible damage to the instrument. The company representative assured us that the truck could attain a speed of 15 miles per hour for a short distance, such as crossing an intersection or railroad crossing.

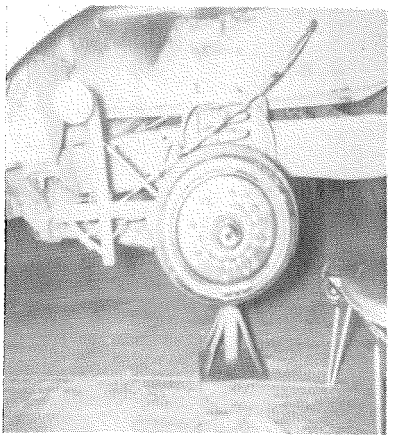

FIG. 1.—Speedometer wheel mounted on front wheel of pick-up.

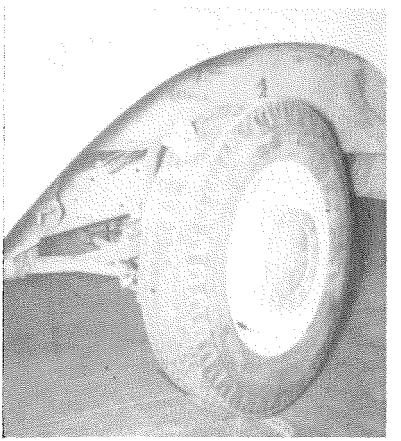

FIG. 2.—Wheel in position against tire.