further increased the catches by 2.5 times more than the controls. Under ideal field conditions these small traps caught as many as 48 larvae per minute. This was exceptional. The overall average for a 24-hour period was 0.5 per minute, with water temperatures ranging from 1.1° C. to 10° C. during the study period. In addition to mosquito larvae, mosquito pupae, frog, salamander, and dytiscid larvae were caught in small numbers.

A SUCTION-TYPE COLLECTING APPARATUS FOR MOSQUITOES

S. F. BAILEY [1]

Many entomologists are aware of the health hazard of aspirating by mouth large numbers of insects. Marking-release-recapture experiments with *Anopheles freeborni* Aitken necessitated collecting large numbers of adults from resting sites. This mosquito cannot be collected in numbers by means of CO_2 traps as was done in flight studies of *Culex tarsalis* Coq. (Bailey, *et al.* 1965 [2]). Small suction devices such as those operated with flashlight batteries were inefficient for our purpose and enabled too many mosquitoes to evade capture. Therefore, to avoid bronchial and lung irritation from aspirating wing scales, dust, fungi, etc., a more powerful mechanical and portable apparatus was needed.

A surplus 12 volt motor and fan unit such as employed to ventilate the pilot's compartment in military aircraft was adapted to our purpose. A section of lightweight steel tubing 6 inches in length by 4.25 inches in diameter was brazed onto the fan housing. The handle, including the switch, such as used on portable power tools, was bolted onto a bracket attached to the base of the fan housing. A liner was added to the tube to prevent air leakage and allow the replaceable air collecting receptacle to fit snugly.

A standard cardboard mailing tube was employed as the collecting unit. The bottom was cut off and bobbinet cloth taped over the opening. The cloth allowed sufficient air to pass through it and resulted in minimal injury to the mosquitoes in comparison with a wire screen. If a large composite collection was made for marking and later release, the adults were shaken or blown into a holding cage. When the collection at a preselected site was completed in recapture experiments the cap was placed on the tube, the motor shut off, the tube labeled, and the mosquitoes chloroformed.

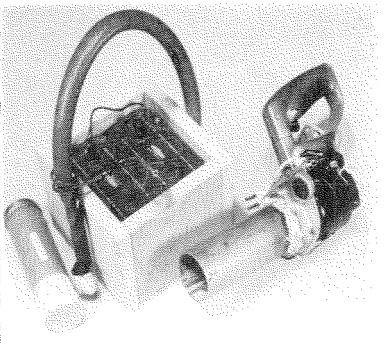

FIG. 1.—12 volt suction apparatus for collecting large numbers of mosquitoes.

The power source used was two 6-volt, flasher type, dry cell batteries (Fig.1), such as Eveready No. 731, NEDA918, or a 12-volt lightweight motorcycle wet cell battery transported in a tool box. If the collecting site could be reached with a 25 to 30 ft. extension cord clamped to the poles of an automobile battery, or plugged in the cigarette lighter, the portable batteries were not needed. In the majority of cases, however, collecting sites were not accessible by auto. The dry cell batteries last about 10 hours when operated for short intervals of about 3 to 5 minutes. The wet cell battery, if recharged, will last through two seasons of collecting. The total cost of the dry cell collection unit as illustrated was about $11.00. The original pilot model was constructed in 1963 by D. A. Eliason.

MODIFICATION OF A GRASS SEEDER FOR GRANULE DISPERSAL

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During the past eight years 184,000 applications were made to 174,900 acres with 1,266,000 pounds of granular larvicide in the Metropolitan Mosquito Control District. Most of the applications to these small sites were made with the "Cyclone" brand grass seeder. This machine generally performed satisfactorily but replacement and repair costs were high. Cattails, grasses, and other vegetation got caught in the gears between the slinger plate and the bottom of the granule hopper. This forced the gears to separate, lose alignment, or to break. The loss of operator time in removing this vegetation was considerable.

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[2] BAILEY, S. F., ELIASON, D. A. and HOFFMAN, B. L. Flight and dispersal of the mosquito *Culex tarsalis* Coq. in the Sacramento Valley of California. Hilgardia 37:73–113.

The seeder as purchased also threw some granules in a full circle, thereby striking the abdomen of the operator and trickling down into his boots.

Several modifications to correct these defects were made over a period of time and were tested by the field staff of the MMCD. The best of these designs was mass produced, mounted on 90 seeders and used during the 1965 mosquito control season. The device consists of a circular plate 12 inches in diameter, along the circumference of which is welded at right angles a metal strip 2 inches high by 12 inches where it joins the plate. The metal strip is centered to the rear and acts as a deflector to keep granules from striking the operator. A hole 5/16 inches in diameter is drilled in the exact center of the circular plate and centered directly below the slinger plate shaft. The leading edge of the circular plate is 7/8 inches ahead of the slinger plate and acts as a protective bumper or weed deflector. The plate is made of 20 gauge mild steel which is sufficiently heavy to withstand considerable rough use. The circular plate is attached to the bottom rear of the seeder by two 3/16 by 1 inch bolts to the fan assembly bracket and to the front bottom of the seeder by one 3/16 by 5-1/4 inch adjustable bolt. (Fig. 1 and Fig. 2).

The plate with deflector will last many years with little maintenance outside of a coat of non-fouling paint occasionally. Each plate cost $2.25 to make and will outlast several seeders; it will prolong the life of a seeder 2 to 3 times longer than one not so equipped. It can be replaced from one seeder to another in less than 15 minutes. The device allows the entire seeder to be carried upright during transportation in a truck and protects gears and slinger plate from damage. It does not change the swath width or pattern of granules.

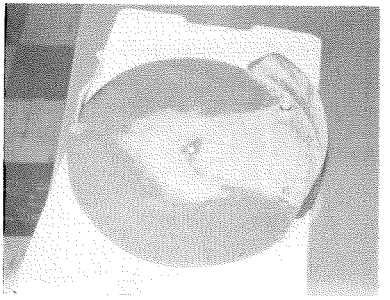

FIG. 1.—Dismounted plate showing attachment bolts.

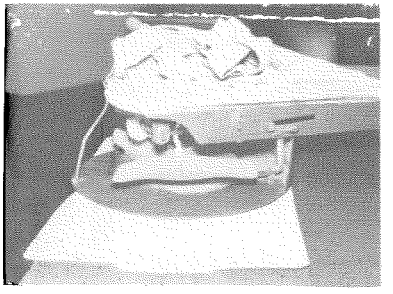

FIG. 2.—Plate attached and ready for use.

A GYNANDROMORPH OF *Culex pipiens quinquefasciatus* (SAY)

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Gynandromorphs have been reported in mosquitoes for a number of years. Lum (1960) reports 39 cases in *Aedes taeniorhynchus*. Rai and Craig (1963) report 100 cases in *Aedes aegypti*. Taylor, *et al.* (1966) report 20 gynandromorphs found in the genus *Culex* in the Tampa Bay area in a period between 1962 and 1964.

It is not known exactly how mosquito gynandromorphs occur. Gilchrist and Haldane (1947) suggest these possible reasons: somatic crossing over, improper migration of chromosomes at an early mitotic division, and double fertilization involving two sperm cells and either a binucleate egg or an egg and a polar body. Findings by Rai and Craig (1963) suggest that gynandromorphs in mosquitoes are produced by double fertilization.

The specimen described here came from a colony maintained in the genetics laboratory in the Department of Zoology, Louisiana State University. The colony was established in 1965 from locally collected material and has been in the laboratory for about one year.

The specimen (Fig. 1) clearly showed an anterior-posterior organization in which the head is that of a typical female, with two normal short palpi and female antennae, while the abdomen is that of a male, showing typical male genitalia.

The mosquito was given several opportunities to feed but it did not do so; nor did it attempt copulation when placed with several normal females. It lived for approximately one week, during which time it was photographed by Mr. Thomas C. Stewart of this department.

References

GILCHRIST, B. M., and HALDANE, J. B. S. 1947.

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