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.

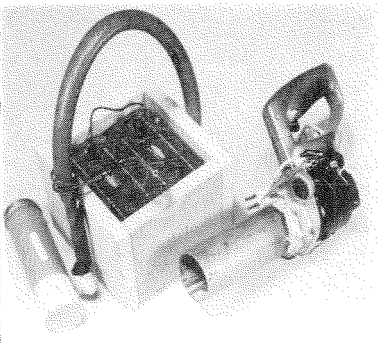

FIG. 1.—12 volt suction apparatus for collecting large numbers of mosquitoes.

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

C. L. MARTIN, J. SKOGLUND AND E. WERMERSKIRCHEN

Metropolitan Mosquito Control District, St. Paul, Minn. 55114

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.

[1] Department of Entomology, University of California, Davis.

[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.