distinguishable without genetic and histological analyses (Engelmann, 1970).

The specimen has been deposited in the Iowa Insect Collection, Iowa State University, Ames, Iowa.

Literature Cited

Engelmann, Franz. 1970. The physiology of insect reproduction. Pergamon Press, Oxford. 307 p.

Wigglesworth, V. B. 1934. Insect Physiology. Methuen & Co. London. 134 p.

A NEW BOTTOM-DRAFT LIGHT TRAP FOR MOSQUITO STUDIES[1]

LCDR R. H. GROTHAUS, MSC, USN AND S. C. JACKSON

Naval Medical Field Research Laboratory, Camp Lejeune, North Carolina 28542

Light traps are commonly used for surveying mosquito populations. Most collections fall into two categories: those samples where the mosquito density and diversity are of interest, and those where live specimens are needed for disease vector or rearing studies. When population data are desired, most workers use the New Jersey light trap designed by Headlee (1932). This trap can be modified into a live trap, Floore and Grothaus (1971), but the trap does not perform as well as others for this purpose. The CDC miniature light trap developed by Sudia and Chamberlain (1962) has proven to be one of the most popular traps for collecting live material. This trap also has the advantage of being portable since it is very lightweight and is powered by batteries. Workers desiring a portable kill-trap have modified the CDC trap using a design by Stewart (1970).

In 1970 the second author began working on a trap to provide the field worker with a sampling device that could be used for multi-purpose collecting. His goal was to develop a trap that would provide the features of both the New Jersey and the CDC trap, without the disadvantages of either.

DESIGN. The trap is basically a tube within a tube. The exterior portion of the trap is constructed from lightweight galvanized metal, and is 16 cm in diameter by 42 cm high (see Fig. 1). The holding or killing cage consists of a No. 10 can with the top replaced by a removable screen and the bottom replaced by an inverted screen cone. The internal system consists of a 6-12-volt (Allstate) automobile defroster fan mounted in an inverted position (Fig. 2). An automobile headlamp bulb (Westinghouse, No. 1195, 50 c.p. 12v) is mounted below the motor and the light beam is directed downward and through the collecting cylinder (Fig. 2). The trap receives electricity from a 12-volt lead acid battery which operates the fan motor and the light. The system is activated at dusk by a photoelectric switch[2] which automatically turns the trap off at dawn.

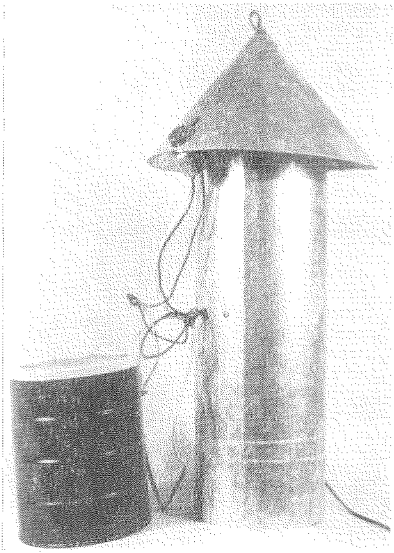

FIG. 1.—Exterior view of new bottom—draft light trap and the internal holding cage.

DISCUSSION. This trap has several advantages over older types. The system can be designed for AC current or DC current without loss of efficiency. The trap is configured so that the entire holding cage is protected from rain, resulting in perfect specimens. Insects caught in the trap are not submitted to damage from the fan blades. The updraft principle appears to enhance collection efficiency for many species of mosquitoes, but larger insects are seldom caught. The elimination of extraneous flying insects from the cage greatly reduces damage to the mosquitoes and also decreases the amount of time necessary for specimen sorting.

Because of the protected cage, live specimens are easily obtained. However, by attaching Vapona® strips to the collecting cage, it is easy

[1] The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

[2] Purchased from Concession Supply Company, 3916 Secor Road, Toledo, Ohio 43613.

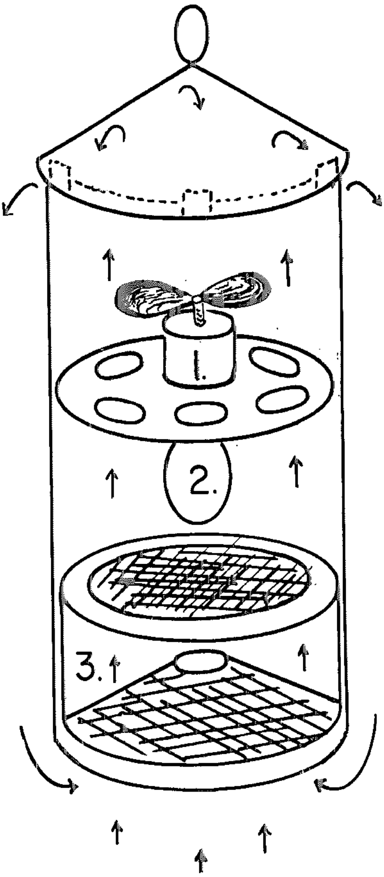

Fig. 2.—Internal view of the new bottom-draft light trap. 1. Inverted fan. 2. Light source. 3. Holding cage.

to obtain a kill-cage. Several cages can be carried so that transfer of specimens can be accomplished in the laboratory if desired.

The combination of the light source and the updraft appears to enhance the collection of species normally repelled by one or both of the other two commonly used traps. The configuration of the trap should prove of value when Co_2 is used as an additional attractant. The design of the trap holding cage greatly simplifies the handling and transfer of live specimens. Except for the photoelectric switch, the components of the trap can be made or purchased from local sources at minimum cost.

Although the trap efficiency has not been compared to a standard trap with respect to species diversity, it has been operated in the field and appears to attract most of the species commonly collected by the other light traps. To date the species spectrum for the trap includes *Aedes atlanticus, A. taeniorhynchus, A. infirmatus, A. canadensis, A. fulvus pallens, Anopheles crucians, Culiseta melanura, Culex quinquefasciatus, C. salinarus,* and *Psorophora ferox.*

Acknowledgment. Mr. E. R. Babcock, Chief, Equipment Testing and Development Division, Naval Medical Field Research Laboratory, is thanked for building the prototype unit and making valuable suggestions during the development period.

Literature Cited

Floore, T. G. and R. H. Grothaus. 1971. Conversion of the New Jersey light trap for collecting live mosquitoes in Da Nang, Vietnam. Mosq. News 31(2):221–222.

Headlee, T. J. 1932. The development of mechanical equipment for sampling the mosquito fauna and some results of its use. Proc. Ann. Meet. N. J. Exterm. Assoc., pp. 106–126.

Stewart, W. W. A. 1970. A modified CDC light trap. Mosq. News 30(2):188–191.

Sudia, W. D. and Chamberlain, R. W. 1962. Battery light trap, an improved model. Mosq. News 22(2):126–129.

OBSERVATIONS ON LARVAE AND PUPAE OF *AEDES ATROPALPUS* (COQ.) CONFINED TO A BOTTOM AIR-WATER INTERFACE [1]

William E. Bickley and John B. Duvall
Department of Entomology,
University of Maryland, College Park 20742

Meola (1961) reported that larvae of *Aedes aegypti* (L.) and *A. triseriatus* (Say) could be reared in inverted culture tubes. Some larvae, forced to obtain air at the bottom of the medium, overcame the effects of gravity. Mortality of pupae was high, but a few adults emerged. The number of individuals observed is not specified.

The objective of the work reported here was to determine whether or not *A. atropalpus* (Coq.) larvae and pupae would tolerate an inverted air-water interface. The medium consisted of small amounts of very finely ground dog food in seasoned tap water. First instars were placed in

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