OPERATIONAL AND SCIENTIFIC NOTES

MASS PRODUCTION OF MOSQUITO LARVAE.—That tropical-fish fanciers have utilized mosquito larvae as food for their fish is well known. Many of them spend considerable time in the field during warm weather collecting the larvae in quantity so as to give their fish a "real treat." In fact, the excess collected is put into small closed containers, frozen and stored for use at a later date when the living ones are no longer available. For the last two years the author has been producing *Culex pipiens* and *Culex restuans* in metal tanks in such quantities as to make mass production and wholesale distribution to pet shops profitable.

The production of larvae is relatively simple but the problem is to produce them in extremely large numbers in water free of floating debris so that only pure larvae are removed by means of a hand net. All of the manures and other media used added too much unwanted material to the tanks and consequently to the containers of larvae.

The following method eventually proved most satisfactory. About twenty metal tanks (cattle watering-troughs) were placed on the ground and filled with spring water from a garden hose. The tanks measured approximately 3 x 6 x 2 feet. The water was kept at a depth of about 1½ feet. Ears of dried corn were then added to the water at the rate of four per tank and allowed to decay. Usually the kernels remained on the ear which either sank or floated. A bacterial scum formed on the surface of the water and was, after three weeks in June, covered with the rafts of culicine eggs. Following this, larvae (and pupae) were netted every three days through the month of September. Each tank yielded about sixteen ounces (bulk, not weight) per week which were put into plastic bags, sealed, and frozen, for distribution to pet shops.

Several points of interest, which will sound familiar to mosquito men, have been noted. A shallow tank will produce more larvae than a deep one. Several small tanks will produce more larvae than one large one since the production is mostly confined to the edges. The proportions of the various species changed as the conditions within the tanks changed. Obviously other species of mosquitoes appeared at intervals. For example, *Culex pipiens* was most abundant when the rainfall was slight and there was a heavy growth of bacteria. *Culex restuans* increased in proportion whenever the water became diluted by heavy rainfalls. The last observation was that there was practically no biting by adults in the vicinity. —Charles O. Masters, Walhonding, Ohio.

A VERSATILE MOSQUITO REARING CAGE.—There are many occasions where it is helpful to rear larvae to obtain the fourth instar larval skin as well as the adult mosquito for study purposes. Mr. Thomas W. Bordner, foreman, designed and constructed to comply with my requirements a relatively simple rearing cage which has been in successful use this past year at the Toledo Area Sanitary District laboratory. Mr. Robert H. Coker, equipment operator, made the drawings and helped compose the following directions. May they prove useful to you. (See Figures)

For the base of the rearing cage any soft wood is suitable. We used white pine measuring ¼" thick, 3½" wide and 12" long. Measure in from either end 1¾" and 1¾" from either side. This will give the center of the 3" hole to be drilled at this point for a depth of ¼". Use a wood chisel to clean out excess wood and make a smooth finish to the bottom of the recess. If the drill penetrates the base, plug the hole with plastic wood or glue. (A pull-out tray can be fitted under the recess to facilitate easy removal of adult mosquitoes, but we still have this to do!) Trim off ¾" from both sides of the base, stopping 3½" from the end with the recessed hole.

The 'stop' or movable brake is made of two ¼" x 1½" x 1½" blocks for brakes with another block ¾" x 1½" x 2" for spacer. Drill a ¼" hole in each brake 1" from the bottom edge and ¾" from the side edge. Drill a ¼" hole through the spacer block using one brake for guide. Make sure the edges are flush. With a ¼" x 4" carriage bolt and wing nut secure this 'stop' device to the handle of the base.

Take a piece of wood 3½" x 3½" x ¾" and cut diagonally, making a 45° angle brace to be mounted on the base with a 3½" side down to hold the cone in place.

The cage is made of #16 mesh screen 9" x 9". Roll two sides together and secure. Cut a circle 3" in diameter and secure to one end of this cylindrical cage. Approximately half way up one side cut a 1" hole. Make a cone from #16 mesh screen 4¼" x 8½" with a diameter of 5" at the base and 1" at the top. Place the cylindrical cage in the 3" diameter recess of the base and slip the cone's small end in the 1" hole in its side. The cone should rest on the base block. Fit the angle brace under the cone, mark its position and secure the angle brace to the base and the cone to the angle brace.

In use, any medium sized bottle can be placed in the cone and held firmly in position with the adjustable 'stop.' The slanting position of the bottle reduces housekeeping chores by permitting evaporation of water without hindrance to larval or pupal life and at the same time makes available a maximum of water surface and adult resting surface. It has been our experience that adults will proceed up the cone into the cylindrical cage where they can be held indefinitely with little possibility of drowning. Both the bottle and cylindrical cage can be removed at will to secure larval skins or adult specimens.

We have in satisfactory use this cage and one of half these dimensions. Of course, it could be made on a much larger scale and adapted for use other than mosquito rearing.—Elizabeth K. Lennox, TASD Technician.