In the Laboratory

Black Fly Incubator-aerator Cabinet

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The writer, in need of large numbers of parasite-free black flies, designed the cabinet described below. It has been in operation each summer for the past five years and has supplied all the black flies required for experimental and taxonomic use.

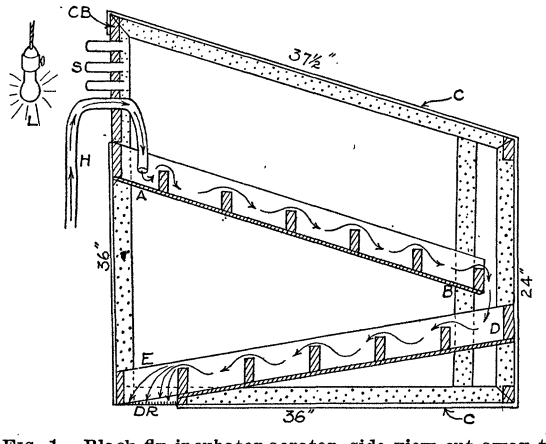

FIG. 1. Black fly incubator-aerator, side view cut away to show operation and construction of the interior.

The cabinet consists of a frame made of 1×2-in. pine lumber covered with heavy dark canvas. Cypress would probably be superior to pine for this purpose. The front of the frame is 36 in. high and 18 in. wide. Near the top, on the front side, is a compo-board, CB, 1 in. thick, bored to accommodate a dozen ¼×2½ in. shell vials, S. One of the holes is used for a hose connection, H, with a lake-water supply faucet. Inside the cabinet, just below the compo-board, is a wooden trough, AB, with sides 4 in. high and a bottom 16 in. wide. At intervals throughout the length of the trough, 3-in.-high baffles are arranged to make a series of pockets to form a riffle board. This trough is sloped to the back so that the water, when turned on, spills over into a similar riffle-board trough, DE, which in turn carries the water off to a drain, DR, in front. The drain is covered with fine-mesh, copper-wire screen to prevent any flies from escaping at this point. The canvas cover, C, is tacked on all but one side, where the flaps are buttoned or pinned. These flaps may be rolled back to allow easy access to the riffle boards from the side. The canvas on the bottom of the cabinet is tacked near the drain so that it is constantly soaked with water. The evaporation of the water up the sides of the cabinet serves as a method for cooling the interior.

Vegetation, covered with eggs, larvae, and pupae of black flies, is collected from a stream, brought back to the laboratory in minnow buckets half-filled with water from the stream, and placed in the shallow compartments formed by the baffles. The water in these buckets is then poured into the upper trough in order to save any larvae which detach from the vegetation while in transit. Within a day or two most of the larvae are attached to the baffles. The canvas side-flaps are closed tightly, and an electric light, L, is turned on in front of the vials in order to attract into them the emerging flies. The males appear first, followed later by the females. One filling of the troughs from a field collection will last for several weeks. Flies are collected in the vials daily. The effect of an abundant food supply on the flies will be noticed within a week or two, as these later-emerging flies are much larger than those caught in the wild.

Although the cabinet has been used primarily to collect black flies, it will work equally well with chironomids, caddis flies, and other rapids-inhabiting insects.

Sintered Glass Disks

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A method is described for the laboratory manufacture of sintered glass disks of various sizes and porosity. The disks include a glass ring which gives them increased strength, resistance to mechanical shock and easy removability for cleaning or replacing by a disk of another porosity. In this laboratory these disks have been used successfully in funnels in connection with rubber gaskets known as "double rubber cup washers" which are obtainable from any plumbing supply house. The details of this assembly are presented in the accompanying illustration.

To make the disks, a pyrex glass ring of the desired size is cut from glass tubing, placed on a galvanized iron plate and heaped to overflowing with powdered pyrex glass screened to a size which will give the desired porosity. The plate is then placed in a furnace (preferably muffle) at 975° C. for about eleven minutes and then removed and allowed to cool. Depend-

ing on the size of the furnace, the time may be varied by a minute or two, in order to produce proper adhe-

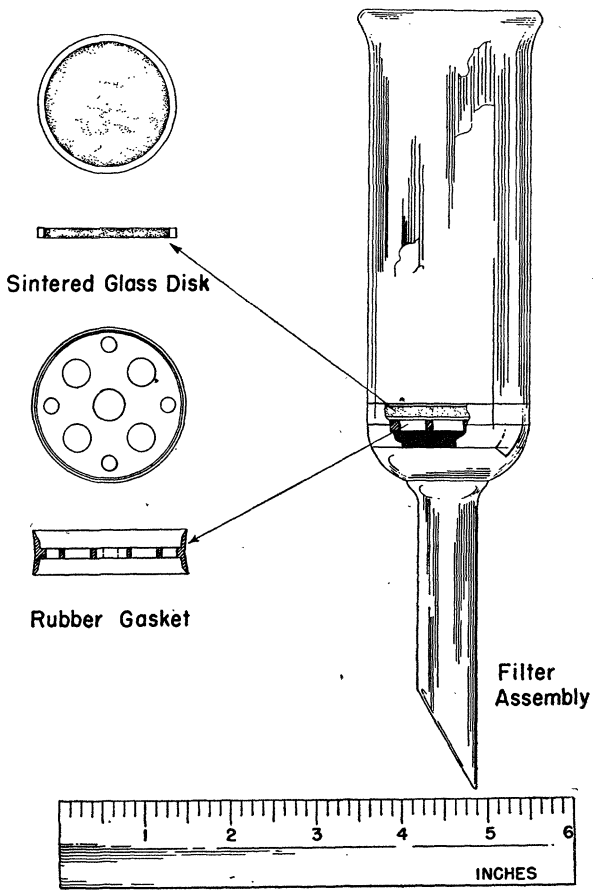

FIG. 1

sion of the pyrex granules to themselves and to the ring. The disk may be polished by rubbing against a flat glass plate with powdered glass as an abrasive.

Attachment of Electroencephalographic Electrodes

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A perpetual problem in electroencephalography has been to secure an expeditiously applied, electrically stable, comfortable, and readily removable attachment of electrodes to the scalp. After trying various methods, most workers return to the use of flattened solder pellets with electrode paste, attached to the scalp by collodion (F. A. and E. L. Gibbs. *Atlas of electroencephalography.* Cambridge, Mass.: L. A. Cummings, 1941). This method requires an air blast for drying the collodion. If electrode paste is rubbed into the scalp area to reduce skin resistance, the collodion does not adhere readily, and, once satisfactorily applied, is difficult to remove from the scalp and hair without the use of objectionable solvents.

The possibility that a more satisfactory material than collodion might retain the general advantages of the technic while eliminating its disadvantages led us to experiment with other adhesive materials. Having found a paraffin wax of low melting point (47° to 49° C.) very satisfactory and having used it ourselves for the past year, we wish to call the attention of others to its advantages.

After massaging a point on the scalp with a finger tip moistened with a commercial electrocardiograph paste, an electrode with a bit of paste is placed on the area, and it is painted over with melted paraffin by means of a small stiff brush. At 50° to 55° C. this causes no discomfort. Excessive hardening of the wax and elevation of melting point is avoided by using fresh paraffin. Electrodes so applied have been found to be as stable as those attached with collodion, and both electrodes and paraffin are readily removed by gently scraping away the paraffin with a coarse comb.

A Potometer for Rapid Measurements of Ingestion by Haustellate Insects

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In an investigation of the nutrition of the blowfly, *Cynomyopsis cadaverina,* it was necessary to measure accurately amounts of food ingested by individual flies. Gravimetric methods for this are exact, but they are time consuming. To facilitate these measurements, therefore, a potometer was developed to make these determinations volumetrically. This potometer, beside its utility in studies on nutrition of flies, should be valuable as a tool for the rapid measurement of ingestion in testing the toxicity of insecticides. With appropriate modifications, it could easily be adapted for use with haustellate insects other than flies.

The construction of this instrument is illustrated in Fig. 1. It consists of a piece of capillary tubing, bent as shown, with a scale graduated in millimeters fastened to it by means of small pieces of wire. The bore of tubing used would be determined by the amounts of ingestion expected. One end of the tubing is slightly expanded and a small wick of filter paper (not shown in the figure) is inserted.

The potometer is filled at the plain end by means of a pipette, and the meniscus brought onto the scale by absorbing the excess fluid with a piece of filter paper applied to the wick. The insects are allowed to