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

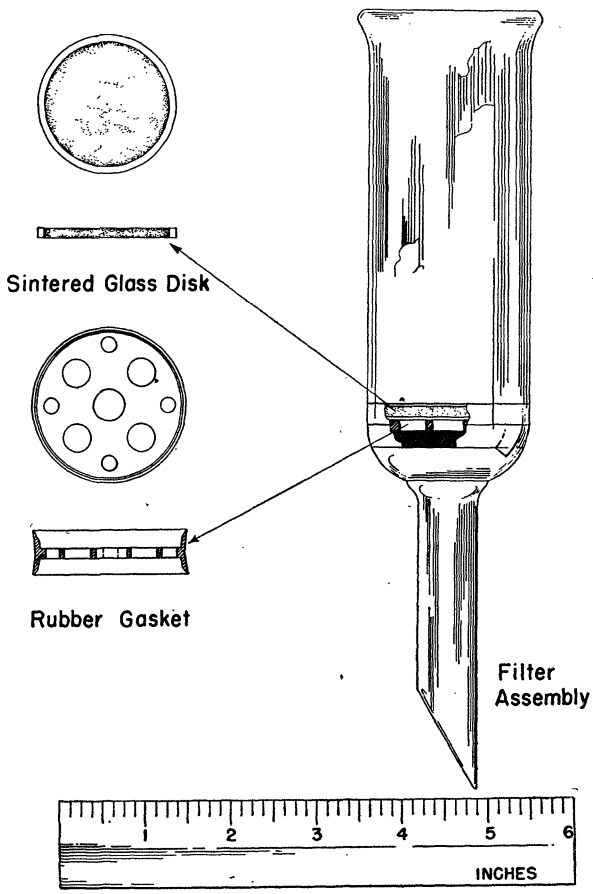

FIG. 1

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

suck the fluid (a sucrose solution, in the experiments with *Cynomyopsis cadaverina*) from the capillary tube through the filter paper, and the amounts ingested are measured in millimeters by following the movement of the meniscus along the graduated scale.

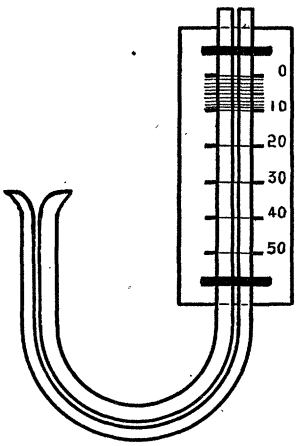

FIG. 1. Construction of the potometer. The bore of the capillary tubing is greatly exaggerated.

To convert amounts in millimeters, an obviously arbitrary measurement, to absolute volumes, the potometer must be calibrated. To do this, it is necessary merely to determine the weight of mercury represented by each centimeter along the scale, and then to convert this, using the density of mercury, into the volume represented. Benedetti-Pichler (*Introduction to the microtechnique of inorganic analysis.* New York: John Wiley & Sons, 1942. Pp. 256–260) gives complete detailed directions for such calibrations. With solutions of known concentration, the exact amount of dissolved material ingested by the individual animal can be measured readily when the potometer is thus calibrated.

One possible correction factor suggests itself. The fluid is evaporating from the wick during the feeding of the insect, and it would seem to be necessary to correct for the rate of evaporation. In our experiments the wick was kept so small that the oral lobes of the flies practically covered it in feeding, thus stopping this evaporation. Also, the rate of evaporation with sugar solutions, and even with distilled water, was found to be so low that there was no appreciable loss through this route for the short time during which each fly fed. This factor, therefore, can be eliminated with appropriate precautions, or it can easily be determined and taken into account in the readings.

Using this potometer, a preliminary study was made of the correlation between time of feeding and amount of fluid ingested to determine to what degree time of feeding could be used in place of amount. Twelve flies (6 males and 6 females) were used in the tests. These flies were mounted for ease of handling by fastening them on blocks of beeswax at the ends of glass rods. They were fed .5 M sucrose solution at 12-hour intervals, with distilled water supplied before each feeding. The results are presented graphically in Fig. 2.

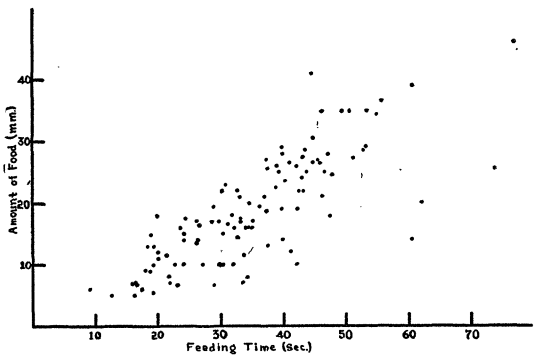

FIG. 2. The relationship between time of feeding and amount of food ingested for *Cynomyopsis cadaverina.*

There is obviously a high degree of correlation between time of feeding and amount of food ingested by this species, the coefficient of correlation (r) being .80 (Fisher's $z = 1.1$). With long times of feeding, however, as the graph shows, the time of feeding may not be an accurate index of the amount. This is probably due to the tendency on the part of some individuals of this species to allow the proboscis to remain extended after reaching satiety, thus giving a time record without really ingesting any food. For work in which a high degree of accuracy is not necessary, the time of feeding is obviously a good measure of amount of food ingested. Where precision is necessary, however, in the measurement of actual amounts, the feeding time is invalid.

A New Glass Device for Staining Cover-Glass Preparations[1]

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Frequently biologists and others who are obliged to work with preparations affixed to cover glasses use methods whereby individual cover glasses must be transferred through fixing fluids, stains, alcohols, and clearing media before being mounted on slides.

[1] Cover-glass staining devices have been described by F. Baer (*Stain. Tech.*, 1929, **4**, 59–60), R. H. Bowen (*Stain. Tech.*, 1929, **4**, 57–58), and T. T. Chen (*Stain. Tech.*, 1942, **17**, 129–130). However, one who has experienced the staining of large numbers of cover-glass preparations should find obvious advantages in this new glass device.