The remaining Greenland station (6) is that of a party of Norwegian hunters supplied with pilot balloons at their station of Mygbukten (Mackenzie Bay) in latitude 73°, where they are operating under the auspices of the Meteorological Institute of Oslo.

UNIVERSITY OF MICHIGAN WILLIAM H. HOBBS

SCIENTIFIC APPARATUS AND LABORATORY METHODS

APPROXIMATE METHOD FOR DETERMINING THE SAME DEGREE OF ANESTHESIA FOR FISH

THIS method is primarily one of electrical stimulation. While it is not hair-splitting in accuracy, still it is very reliable, the criterion for this statement being the number of times the anesthetizing time for any particular fish in the same strength solution checks. The accuracy of this method, of course, depends a great deal upon the acuteness of the power of observation of the operator.

APPARATUS

Fig. 1 illustrates the apparatus used. This consists of a glass cylinder A fastened to a ring-stand by

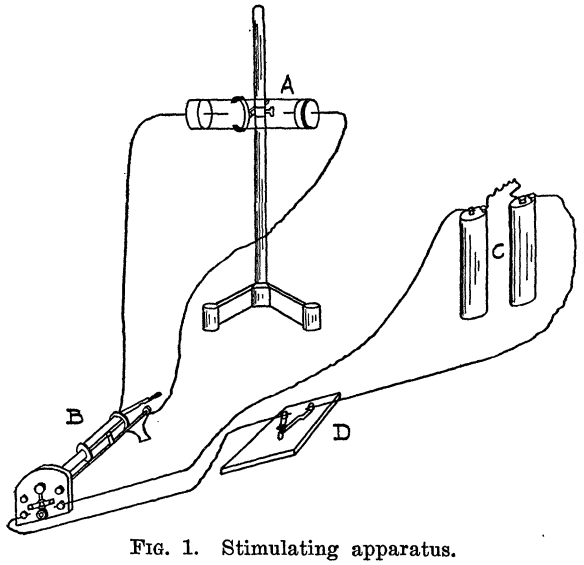


FIG. 1. Stimulating apparatus.

means of a clamp, induction coil B, two dry cells C, a simple key D and two copper stimulating electrodes leading from the secondary coil into the glass cylinder A. Cylinder A is sealed by two rubber stoppers through which the electrodes protrude. The stimulus consists of tetanic induced current from an inductorium receiving its current from the two dry cells. In order to insure the same strength of current (which has been previously determined to be the optimum stimulus), the secondary coil must always remain at the same position in the inductorium. The dry cells should also be tested at regular intervals with the voltmeter. The electrodes leading into the glass cylinder A should be cleaned thoroughly every time the apparatus is put into use. The interrupter points of the inductorium should be readjusted in order to maintain the pitch of the vibrator. The circuit is established by closing the simple key D.

TECHNIQUE

Cylinder A is placed in a vertical position and filled about four fifths full with the solution to be tested. The same number of cubic centimeters should be used each time. The fish is introduced immediately into the cylinder, at which time a stop-clock is started. The removable stopper is replaced and the glass cylinder returned to the horizontal position. After a second or so, depending upon the strength of solution, the fish is stimulated at intervals by pecking on the simple key D until it gradually becomes less and less irritable. Finally the response obtained will change from an active response of the whole fish to local muscular contractions of the tail at which point appear also, to a close observer, tremors comparable to "ether tremors" as reported by Hewitt.[1] It is a mistake to continue stimulating until no response is received, because in the majority of cases where this is done the fish will not recover.

It can then be seen by the above brief description that the success of this method depends upon (1) keeping the strength of current as nearly constant as possible; (2) the ability of the operator to recognize the transition from response of the fish as a unit to local contraction of the tail muscles, and (3) the recognition of the accompanying tremors.

D. J. VERDA
W. P. ELHARDT

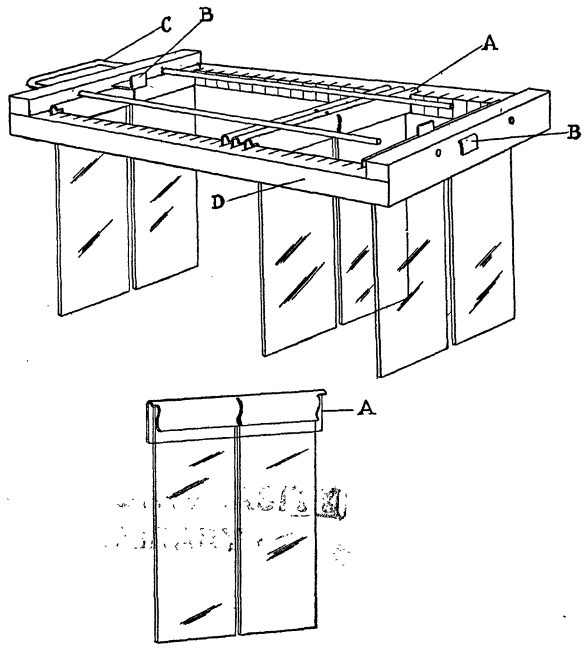
PHYSIOLOGICAL LABORATORIES,
UNIVERSITY OF ILLINOIS

A NEW STAINING RACK FOR MICRO-SLIDES

THE rack here described and illustrated consists of a metal frame (D) appropriately slotted to receive a number of metal clips (A) of a particular design, which hold the micro-slides. The frame and clips are made of non-corrosive metal. However, no part of the rack, neither frame nor clips, is immersed in the staining bath. The clips are made of thin strips of an elastic metal folded lengthwise, the fold viewed on end having somewhat the bend of the traditional shepherd's crook. One side of the fold is wider and longer than the other; the projecting ends of this side, the upper borders of which are bent over in the

[1] Hewitt, "Anesthetics," p. 363, 1912.

direction of the fold, fit into the slots in the frame and hold the clips in place. The shorter fold of the clip is cut in half by a vertical slit. The clips are designed to hold the slides by one end only. Each clip will hold two slides each one inch wide, or one wider slide up to two inches in width. When two one-inch slides are in a clip, either can be removed without disturbing the other. In use, the two end clips and their slides are made to serve as legs, or supports, for the rack by pushing in the catch (B) at each end of the frame; the other clips with their slides are then dropped in place. The rack and clips are supported by these legs above the level of the staining bath. Every clip in the frame is held inde-



pendently of the others and apart from the two end clips serving as legs, as few or as many as may be desired can be put in up to the capacity of the rack. Any clip with its slides, except the end ones, can be readily removed for examination at any stage of the staining process without disturbing the others. If desired, all the clips in the frame can be secured against falling out when the rack is in any position by sliding the U-shaped rod (C) into the holes in the ends of the frame.

Compared with the ordinary basket-like type of rack in which the rack and slides are more or less completely submerged in the staining bath, this new rack, in contrast, is not immersed at all; only the free portions of the slides are immersed and then not more than deep enough to submerge the specimens on them. On taking the slides out of the bath, the quantity of fluid adhering and withdrawn with them is small in comparison with that taken out by the ordinary style rack. A noticeable economy is achieved in the quantity of stain used, and at the same time the quantity carried over into any succeeding bath, contaminating it more or less, is reduced to the minimum practicable in quantity staining.

When compared with other staining racks in which the slides are held at one end but secured by a screw this new rack is decidedly the more convenient to work with; the slides can be taken out and put back without disturbing the others and in a fraction of the time required to unscrew and again tighten the screw type of holder.

Another advantage of this new rack is that it will hold two-inch slides as easily as one-inch ones, and both widths of slides may be stained at one and the same time.

The staining rack here described is not on the market; it was made as an experiment and has been found the most satisfactory rack for quantity staining with which the subscribed is familiar. The size of the rack is approximately 6 inches long by 2⅞ inches wide, and holds 62 one-inch slides or 31 two-inch slides.

This particular size was selected because it fitted nicely in a covered dish that was obtainable in the market.

Made as a special job, the cost was quite high, but should the design appeal to microscopists it could be supplied at a less cost. The Arthur H. Thomas Company, of Philadelphia, Pennsylvania, had the rack made for me.

W. F. R. PHILLIPS

DEPARTMENT OF ANATOMY,
THE MEDICAL COLLEGE OF
SOUTH CAROLINA

SPECIAL ARTICLES

THE LETHAL DOSE OF ULTRA-VIOLET LIGHT FOR BROOK TROUT (SALVELINUS FONTINALIS)

MANY chemical agents have been studied by fish culturists in attempts to check the epidemics of parasitic diseases that frequently cause severe financial losses in the best trout hatcheries. Although some of these agents are quite effective in checking fungus growths, they are often difficult to apply since the fish must be removed from the troughs and the troughs must be sterilized separately.