SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW MICROMANIPULATOR

IN some recent work with amebae it was necessary to isolate individual cysts and vegetative forms. Complex devices such as the Chambers or Taylor micromanipulators were impracticable for this purpose. The above apparatus is relatively simple, and has the important advantage of picking up objects from the upper surface of the slide.

Dr. H. C. Hinshaw, formerly of this department, had this manipulator built. It is attached to the binocular body of a Leitz microscope (Fig. 1); and

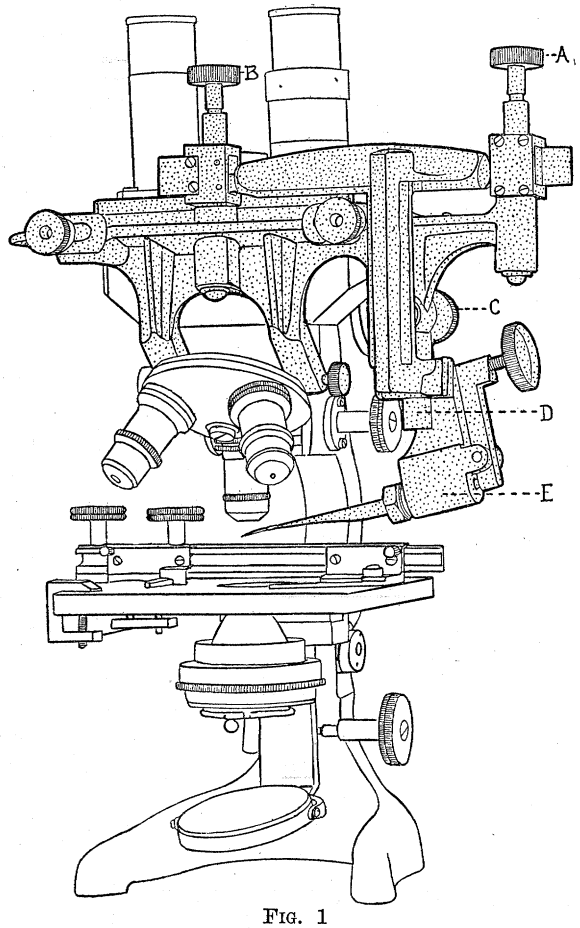

FIG. 1

therefore, since it moves up and down with the adjustment of the microscope, the pipette is always in focus. It is used with the 16 mm or as high as the No. 5 Leitz objective. The manipulator itself is made of aluminum with German-silver springs and screw thrusts. Two vertical screw thrusts (A and B) push against steel balls working in a groove. They give movement in the vertical and one horizontal plane. The horizontal screw thrust (C) pushes against a steel spring (D) and gives movement in the third plane.

Dr. Hinshaw left before perfecting the instrument or working out a satisfactory method of pipette control. After many trials of various devices a new pipette holder was built (E and Fig. 2). It is essen-

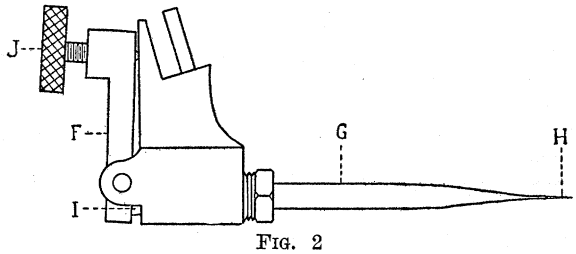

FIG. 2

tially a modification of the Taylor holder, except that it is smaller and makes use of the principle of the lever (F) and removes the screw from the direct line of the pipette. In this way much more delicate control is obtained, and movements from the operator's hand are not transmitted to any great extent. It consists of a brass cylinder into which fits a piece of glass tubing (G) filled with mercury and capped with a piece of rubber. Into the smaller end of this mercury column is cemented the micropipette (H). A metal plunger (I) controlled by the thumb screw (J) pushes against the rubber and so controls the column of mercury, in this way pulling in or expelling an object from the micropipette.

The manipulator combined with the mechanical stage gives a unit which has controlled movements in three planes. Stage movements and the coarse adjustments of the microscope give the coarse adjustments of the unit. The screw thrusts of the manipulator plus the fine adjustments of the microscope control the finer movements.

In the handling of cysts of amebae the instrument is used in the following way: A drop of material containing amebae is put in the lower left-hand corner of the slide. To the right of it are placed two or three drops of Locke's solution. To the right of them is a cover slip with a drop of reagent on its surface. A cyst is picked up by the pipette, the mechanical stage is moved along until the first drop of Locke's is in focus, the cyst is washed, picked up, the stage is moved again, etc., until the cyst is finally in the drop of reagent on the coverslip.

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