NOTES.

MICROSCOPICAL TECHNIQUE.—The series of processes and technical methods employed between the fixation of plant-materials for cytological investigation and the completion of the preparations are, in many instances, open to considerable improvement and call for full inquiry on physical lines.

It is proposed to consider in short notes, of which the following is a first instalment, certain difficulties which have arisen in the course of cytological work and to suggest methods by which they can be overcome.

The Stretching of Paraffin-ribbons on Glass Slides.

Considerable difficulty is often encountered in securing perfect stretching of paraffin-ribbons on the slides on which they are being mounted. This difficulty can, however, be easily overcome if the slide on which mounting is to be conducted be uniformly heated to a temperature closely approaching the melting-point of the paraffin concerned, and maintained at that temperature until perfect stretching is secured. A method found successful is as follows:

An earthenware pot with a concave bottom (such as a 'shrimp pot') of about 3 in. in diameter and $1\frac{1}{2}$ in. in depth is employed. It is inverted in a metal dish (say, 7 or 8 in. diam.) containing water. There should be sufficient water to completely fill the pot and to allow the inverted base of the pot to emerge from the surrounding water by about $\frac{1}{4}$ in. only. The water can be easily raised to a temperature just below the melting-point of the paraffin employed, and maintained at this temperature by a small Bunsen flame or by a spirit-lamp. The slide on which the ribbon is to be mounted is flooded with albumin-water, or either Land's gum-arabic-chromate or albumin-chromate fixative, on which the ribbon is floated.¹ The slide is then placed on the inverted concave base of the pot, which now represents a shallow dry basin, on the rim of which the slide is resting. The shallow basin is now flooded by means of a pipette with cold water until the whole of the under surface of the slide is in contact with the water. The slide gradually acquires a temperature approaching the melting-point of the floating paraffin-ribbon, which is gradually and uniformly stretched as heating continues. When no further stretching is observable, the slide is removed from the rim of the basin and most of the surplus fixative is drained away and the ribbon stranded on the slide. Any surplus fixative can then be removed with blotting-paper before the slide is laid aside to dry.

In dealing with very thin ribbons, in which wrinkling is commonly pronounced, it

¹ Bot. Gaz., vol. lix, p. 398, 1915.

is essential to secure a very gradual stretching. This can be secured almost invariably by the above method if the water employed in flooding the basin is initially very cold. The danger of permanent adhesions of opposite sides of folds in the ribbon is thus avoided, and a perfect stretching secured for ribbons of the thickness of 1μ . A sufficiency of albumin-water or other liquid fixative should in all cases be employed to avoid the stranding of the ribbon at any point on the slide before stretching is completed.

In dealing with hard materials, an examination with a hand-lens sometimes shows that, even after stretching of the ribbon has continued for two or three minutes, that of the embedded materials is incomplete. In such cases a complete stretching is secured, with apparently no harmful effects by raising the temperature of the water in the containing vessel to the melting-point of the paraffin.

The slide should be allowed to cool in every case before surplus fixative is removed, and the slide should be replaced on the rim of the basin and in contact with the water before the last portion of the fixative is removed. If this is attended to, full contact between ribbon and slide is secured.

The main surplus of fixative should be drained away by allowing the slide to remain for a short period in an almost vertical position, or by means of blotting-paper which is not allowed to touch the sections. The last traces of unnecessary fixative are removed by three strips of blotting-paper, which are laid over the ribbon and lightly rubbed with the finger.

A more efficient apparatus than the one above described can be made from a brass disc of $2\frac{3}{4}$ in. diameter and $\frac{3}{4}$ in. thickness. The top of this is recessed in the lathe to a depth of about $\frac{3}{16}$ in., leaving a rim $\frac{1}{8}$ in. in width. The hollow thus prepared corresponds to the concave base of the shrimp pot. Three lugs fitted with levelling-screws are fixed below the disc, and serve to raise the latter well above the bottom of the water-bath and to secure a levelling of the slide and an even distribution of the fixative fluid whereby any local stranding of the ribbon, during stretching, may be avoided. Both the disc and the three lugs can be made of lead, instead of brass; it serves admirably and is easier to work in a laboratory lathe. The metal dishes used as water-containers can be obtained at any hardware shop at a cost of a few pence.

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