

NOTES ON MICROTECHNIQUE II.

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The damage done to recently mounted microscopic slides by a class of freshmen is well known; yet is it often impossible to anticipate one's needs sufficiently to allow time for slides to harden. This is especially true of slides mounted in Venetian turpentine, which hardens more slowly than balsam. I have found that slides may be used at once, after being mounted according to the following method.

The Venetian turpentine into which the material is finally brought is allowed to dry until it is quite hard—so thick that its surface may be indented with difficulty. This is softened by being placed on a warming-plate. The material when sufficiently warmed to be thin enough for ready mounting is placed on the slide on another hot-plate, the material is arranged with needles, a cover is added and the material allowed to fill the space under the cover.

With a little more care, stem sections, and even paraffin sections may be mounted in balsam in the same manner. I have been much surprised to find what extreme temperatures sections will endure without damage. By accident, some slides of *Marchantia* antheridia were mounted and left on a hot-plate 22 hours. I supposed they would be ruined, but careful examination showed no damage. A thermometer placed on the hot-plate showed a temperature of 145° C.

A convenient hot-plate for such work or for stretching paraffin ribbons or for warming imbedding-dishes while the pieces of material are being arranged may be made by mounting an ordinary electric bulb inside a box over which a piece of glass has been placed. A discarded photographic negative is satisfactory. For higher temperatures, a piece of zinc or sheet brass is better. Temperatures may be modified by varying the wattage of the electric bulb used. Very high temperatures may be gotten by mounting the bulb vertically and placing over it a tin cylinder covered with asbestos paper. A thin lantern slide plate was used for several weeks over the hot-plate mentioned above as giving a temperature of 145° C. without breakage.

I have been using with great satisfaction the gelatin-glycerin fixative described in the *Botanical Gazette*, April, 1919, by Artschwager. I use phenol instead of sodium salicylate. The results are superior to those obtained by the use of egg albumen.

Even with the best of fixatives, some materials persist in coming off the slide during the staining-process, especially when aqueous stains, such as the haematoxylin, are used. Following a suggestion by Dr. F. D. Lambert, of Tufts College, I have used with excellent results the following method. After the paraffin has been dissolved in xylol and the xylol has been removed with alcohol, the slides are dipped in a very weak solution of celloidin in alcohol and ether. The slides are removed, allowed to drain but not to dry and are carried through the staining-process in the usual way. Celloidin stains heavily in haematoxylin, but by the time the destaining is completed, no trace of the stain remains in

the celloidin. In this way I have saved thousands of slides that would otherwise have been lost. Small structures, such as spores, starch-grains, and the like, are readily retained in the sections.

Recently in mounting some epidermis of tulip for the study of stomata, I noticed that many of the nuclei of the epidermal cells were dividing amitotically. Many stages could be observed in a single field of view. I do not know how commonly this may be found in tulip epidermis, but the material described is the best I have seen for the demonstration of amitosis.