

carefully sharpened plane, which is, in some respects, one of the very best of section cutters where the work does not call for the most critical methods. Preferably the blocks which have been boiled as described may be sectioned on a microtome in the usual way. For this purpose any instrument which provides a high degree of rigidity may be employed.<sup>1</sup> For purposes of very exact study more elaborate methods and more expensive instruments will have to be employed, but since these relate chiefly to botanical laboratories where they are already well known, they need not be specified here.

For the purpose of freeing the sections from air, a somewhat troublesome process where sections are prepared as specified, the air pump may be used; but a far more simple and less costly method is to boil the sections in water for five or ten minutes and then plunge them directly into 95 per cent alcohol. At intervals of five minutes or so alternate the treatment with alcohol and water, and, except in some of the most troublesome woods, such as the spruces and larches, it will be found that the air is all discharged in the course of half an hour. As a matter of precaution the sections should then be left over night in 95 per cent alcohol in order to secure complete dehydration.

Before mounting in balsam the sections must be stained. For this purpose almost any of the well-known aniline stains or Delafield's hematoxylin may be employed, the object being to secure a perfectly sharp and well-defined image on a clear field. But in the study of woods it is often of importance to be able to photograph what is seen, and as all the stains are not equally valuable for this purpose the dye should be selected with special reference to the results sought. Where instantaneous exposures are to be employed nothing is better than Delafield's hematoxylin, which is allowed to act until a deep purple color is produced. But this stain will not answer for time exposures as well

<sup>1</sup> One of the best of simple instruments is the table microtome made by Bausch and Lomb, but the knife used with this form of instrument should be a plane blade mounted in a heavy wooden handle of such form as to secure a perfectly firm grip.