

of a new species. In making a diagnosis for comparison with that of a previously described species similar care is a necessity, particularly in the case of the different hard pines, where a comparatively slight deviation may involve one in considerable difficulty. Until one is thoroughly familiar with the course of procedure to be followed, and has an extensive knowledge of the anatomical details in all their varying aspects as characteristic of different genera and species, the only safe course to follow, when attempting to identify a species, is to make a carefully written diagnosis in full. After this is done comparison with the key or with the supposed species may be made in detail. A comparatively brief acquaintance with the systematic portion of this work will enable one to recognize most of the genera at sight, since the characters are in most cases very clearly defined and easy of recognition; but the same does not hold true of species, since these are defined by a larger number of characters which vary somewhat widely, and exceptional cases are of much greater frequency. Where there is a final doubt as to the identity of a given species, the specimen should be compared with a type section or be submitted to an expert for decision.

*The transverse section* exhibits in the main an end view of the various component elements. It should always be the first of the three to be examined, since it immediately permits a separation of the genera into two great groups and affords suggestions of such a nature as to permit of economy of time at a later stage of the examination. It conveys a correct conception of the presence or absence of certain structural features, such as resin passages, resin cells, or resin cysts and the presence or absence of tyloses; it affords the only accurate measure of regional distribution and of the general character of the growth rings, the relative volume and character of the spring and summer woods, and of the variations which distinguish the tracheids of those regions of growth. When elements have similar terminal aspects, as the spiral and pitted tracheids, as well as wood parenchyma and parenchyma tracheids, the transverse section has no special value beyond that which is to be found in a recognition of