

vicissitudes or alternations of conditions. As a rule, we should infer that the time represented by a given thickness of similar strata was less than that shown by the same thickness of dissimilar strata, because the changes needed to bring new varieties of sediment into the area of deposit would usually require the lapse of some time for their completion. But this conclusion might often be erroneous. It would be best supported when, from the very nature of the

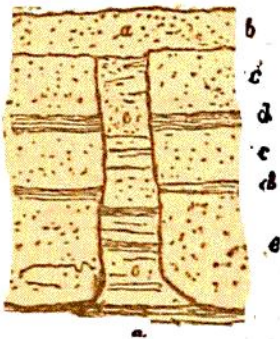


Fig. 224.—Erect tree-trunk (*a a*) imbedded in sandstones (*c c*) and shales (*d d*), its interior filled with different sandy and clayey strata (*e e*), and the whole covered by a sandstone bed (*b*) (*B.*).

rocks, wide variations in the character of the water-bottom could be established.

Thus a group of shales followed by a fossiliferous limestone, would mark a period of slow deposit and quiescence, almost always of longer duration than would be indicated by an equal depth of sandy strata, pointing to more active sedimentation. Thick limestones, made up of remains of organisms which lived and died upon the spot, and whose remains are crowded together generation above

generation, must have demanded prolonged periods for their formation.

But in all speculations of this kind, we must bear in mind that the relative length of time represented by a given depth of strata is not to be estimated merely from thickness or lithological characters. It has already been pointed out that the interval between the deposit of two successive laminæ of shale may have been as long as, or even longer than, that required for the formation of one of the laminæ. In like manner, the interval needed for the transition from one stratum or kind of strata to another may often have been more than equal to the time required