

for the formation of the strata of either kind. But the relative chronological importance of the bars or lines in the geological record can seldom be satisfactorily discussed merely on lithological grounds. This must mainly be decided on the evidence of organic remains, as will be shown in Book V. By this kind of evidence, it can be made nearly certain that the intervals represented by strata were in many cases much shorter than those not so represented—in other words, that the time during which no deposit of sediment went on at any particular locality was longer than that wherein deposit did take place.

Ternary Succession of Strata.—In following the order of sedimentation among the stratified rocks of the earth's crust, the observer will be led to remark a more or less distinct threefold arrangement or succession in which the sandy, muddy, and calcareous sediments have followed each other. Prof. John Phillips and Mr. Hull have called attention to this structure, illustrating it by reference to the geological formations of Great Britain, while Prof. Newberry, Dr. Sterry Hunt, and Principal Dawson have discussed it in relation to the stratigraphical series of North America. According to Mr. Hull a natural cycle of sedimentation consists of three phases; 1st, a lower stage of sandstones, shales, and other sedimentary deposits, representing prevalence of land with downward movement; 2d, a middle stage, chiefly of limestone, representing prevalence of sea with general quiescence and elaboration of calcareous organic formations; 3d, an upper stage, once more of mechanical sediments indicative of proximity to land.¹⁶ Where the strata are interrupted by disturbance

¹⁶ Phillips, *Mem. Geol. Surv.* ii.; "Geol. Yorkshire," ii.; "Geol. Oxford," p. 293; Hull, *Quart. Jour. Sci.* July, 1869; Newberry, *Proc. Amer. Assoc.*