

and unconformability, we may suppose the cycle of sedimentation to have been completed by upheaval after prolonged subsidence. But where the continuity of the formations is unbroken, as it is over such vast tracts in North America, upheaval is not required, and the facts seem explicable, as Phillips long ago showed, on the idea of prolonged but intermittent subsidence. Let us suppose a downward movement to commence, and to depress successive sheets of gravel, shingle, sand, and other shallow water accumulations, derived from the erosion of neighboring land. If the depression be comparatively rapid, the bottom may soon be carried beyond the reach of at least the coarser kinds of sediment, and marine lime-secreting organisms may afterward begin to form a calcareous floor beneath the sea. Let us imagine, further, that the subsidence ceases for a time, and that by the accumulation of organic remains, and partly also by the deposit of fine muddy sediment, the water is shallowed. With this gradual change of depth, the coarser detritus begins once more to be able to stretch seaward, and to overspread the limestones, which, under the altered circumstances, cease to be formed. A gradual silting up of the area takes place, marked by beds of sand and mud, until a renewal of the subsidence, either suddenly or slowly, restores the previous depth and clearness of water, and allows either the old marine organisms, which had been driven off, or their modified descendants to reoccupy the area and build new limestone.

**Groups of Strata.**—Passing from individual strata to

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1873, p. 185; Proc. Lyceum Nat. Hist. New York, 2d ser. No. 4, p. 122; Hunt, in Logan's "Geology of Canada," 1863, p. 627; Amer. Journ. Sci. (2d series), xxxv. p. 167; Dawson, Q. J. Geol. Soc. xxii. p. 102; "Acadian Geology," p. 135. Compare on this subject E. van den Broeck, Bull. Mus. Roy. Bruxelles, ii. 1883, p. 341; A. Rutot, op. cit. p. 41.