

of distinguished men, most of them our admirable contemporaries, in the field of actual investigation, with astonishing toil and perseverance, guided by cautious judgment and habits formed in the study of the exact sciences, have triumphed over what might have appeared a hopeless confusion; and have reduced to a certainty scarcely short of sensible and mathematical proof, the modes of deposition, the order of original succession, and in many cases that of subsequent change.

From the description which I have endeavoured to give, it will be easily understood, that the order of succession is never transgressed; though particular formations, one, two, or more, in a system or subdivisional group, and of course many in the whole series, may and must be wanting. Those formations either have never existed, from the course of operations which I have attempted to describe; or they have been removed by the nearly horizontal action of water, washing away large masses of strata, scattering and diffusing their materials upon the floor of the ocean, and thus producing new formations.

XIII. To such removals, occasion has been given by the elevations and depressions so frequently before mentioned. These have exposed the softer or previously loosened materials, to the incursion of mighty bodies of water, which have washed them away, carried them out to shorter or longer distances, dropping the coarser and heavier portions the earliest, holding longer in muddy mixture and transporting to the greater distances the fine and light particles, spreading them out under the great seas; and there these new strata have been disposed variously, according to circumstances arising from the form and constitution of the bottom, the direction of currents, volcanic action below the bed of the sea, molecular aggregation of similar substances, and chemical attractions.