

CHAPTER IV.

ON STRATIFICATION, AND THE RELATIVE POSITION OF ROCKS.

Strata and Geological Formations explained.—Various Appearances presented by plane Strata.—Appearances presented by curved Strata, and Errors respecting them.—Distinction between Strata Seams and Natural Fissures or Cleavages.—On the conformable and unconformable Positions of stratified and unstratified Rocks.—The Continuity of stratified Rocks broken by Valleys.—Longitudinal Valleys.—Transverse Valleys.—Lateral Valleys.—Denudations.—On the Elevation of Mountains and Mountain Chains.—On the Direction of Mountain Chains in the new and old Continents.—On vertical Beds in Mountains.—On the apparent Devastation in Alpine Districts.—On the Passages in the Alps called Cols; and Observations respecting their Formation.—Different Ages of Mountain Ranges.

WHEN we have ascertained what are the most common or prevailing rocks in a part of any country, and observed that any one stratum or rock which attracts our attention is, in that part of the country, invariably covered by a peculiar rock or stratum of a different kind, or invariably covers any particular stratum; we hence learn, that there is a certain order of superposition, and we naturally feel desirous to know whether the same order is observable in every country where similar rocks occur. Thus, in the vale of Thames round London, there is, at the depth of a few feet under the surface, a dark-coloured clay, called London Clay, much intermixed, in the lower part, with beds of sand. If we bore through this clay, we shall find its average thickness to be nearly 300 feet. When we have pierced through this, we invariably come to chalk;* and were we to continue to bore in the chalk, after piercing through many hundred feet of that rock, we should come to a stratum of sand or sandstone, filled with green particles, and hence called Green Sand.

The observer, who had confined his researches to this part of the country only, would form a very erroneous conclusion, were he to infer that the outer crust of the globe was, invariably, composed of London clay, chalk, and green sand. But, wherever similar beds occur together, they lie over each other in the same order of superposition. Thus, the London clay is never found under the chalk or the green sand.

But, it is not always necessary to bore through the upper beds to ascertain this order; for, the different strata scarcely ever occur in a flat or horizontal position: they, generally, rise in a certain direction, and come to the surface, as represented in Plate I. fig. 1. Now,

* The lower clay is by some geologists denominated plastic clay. See Chap. XIV.