

For, whenever a running stream charged with mud or sand, has its velocity checked, as when it enters a lake or sea, or overflows a plain, the sediment, previously held in suspension by the motion of the water sinks, by its own gravity, to the bottom. In this manner layers of mud and sand are thrown down one upon another.

If we drain a lake which has been fed by a small stream, we frequently find at the bottom a series of deposits, disposed with considerable regularity, one above the other; the uppermost, perhaps, may be a stratum of peat, next below a more dense and solid variety of the same material; still lower a bed of shell-marl, alternating with peat or sand, and then other beds of marl, divided by layers of clay. Now, if a second pit be sunk through the same continuous lacustrine *formation*, at some distance from the first, nearly the same series of beds is commonly met with, yet with slight variations; some, for example, of the layers of sand, clay, or marl, may be wanting, one or more of them having thinned out and given place to others, or sometimes one of the masses first examined is observed to increase in thickness to the exclusion of other beds.

The term "*formation*," which I have used in the above explanation, expresses in geology any assemblage of rocks which have some character in common, whether of origin, age, or composition. Thus we speak of stratified and unstratified, freshwater and marine, aqueous and volcanic, ancient and modern, metalliferous and non-metalliferous formations.

In the estuaries of large rivers, such as the Ganges and the Mississippi, we may observe, at low water, phenomena analogous to those of the drained lakes above mentioned, but on a grander scale, and extending over areas several hundred miles in length and breadth. When the periodical inundations subside, the river hollows out a channel to the depth of many yards through horizontal beds of clay and sand, the ends of which are seen exposed in perpendicular cliffs. These beds vary in their mineral composition, or color, or in the fineness or coarseness of their particles, and some of them are occasionally characterized by containing drift-wood. At the junction of the river and the sea, especially in lagoons nearly separated by sand-bars from the ocean, deposits are often formed in which brackish-water and salt-water shells are included.

The annual floods of the Nile in Egypt are well known, and the fertile deposits of mud which they leave on the plains. This mud is *stratified*, the thin layer thrown down in one season differing slightly in color from that of a previous year, and being separable from it, as has been observed in excavations at Cairo, and other places.\*

When beds of sand, clay, and marl, containing shells and vegetable matter, are found arranged in a similar manner in the interior of the earth, we ascribe to them a similar origin; and the more we examine their characters in minute detail, the more exact do we find the resemblance. Thus, for example, at various heights and depths in the earth, and often far from seas, lakes, and rivers, we meet with layers of rounded

\* See Principles of Geology, by the Author, Index, "Nile," "Rivers," &c.