

valleys? or merely follow the traces left by earlier watery violence? Perhaps we must not yet venture to propose a general answer to such questions;—there exist, however, cases which bear very decided evidence with reference to them. At a little valley in the chalk of Yorkshire (represented in the diagram, p. 318.), which opens to the sea near Bridlington, we behold, as in the above sketch, the solid, laminated, chalk, gently declining to the south, excavated in a broad undulation across the laminæ; over nearly the whole breadth of the hollow thus occasioned, rests an irregular sandy deposit very much of tertiary aspect; above this, a thick mass of diluvial clay with bouldered stones in great confusion; the whole surmounted, in places, by a widely laminated deposit of chalk and flint gravel. Finally, the channel of the existing little rill is cut, certainly by that rill, in places through the whole series of deposits, into the solid chalk beneath. What does this teach us? First, the excavation of the chalk by an agent which wholly swept away the spoils; secondly, a less turbulent agency introducing sand and gravel, so as partially to fill up the hollow, but not to cover the parts of the chalk beyond; thirdly, a violent impulse of mud and stones brought from a distance over this valley, and the surfaces for miles on each side of it; fourthly, variable but extensive deposits of local gravel; fifthly, the work of the actual stream, which gathered in the ancient hollow.

As we know the chalk to have been raised from the sea, this upward movement may suggest to us the excavation of the rock by oceanic currents, and the partial deposition of sand; the general accumulation of boulders and clay demands a general disturbance affecting other, and even remote, districts; while the mass of chalk, flint, gravel, seems the natural effect of a more local and less violent convulsion. In some instances, local gravel of this description lies both above and below the proper diluvium.

The interval of time here supposed to occur between the original excavation of a hollow or valley in the rocks, and the accumulation in it of the spoils of a