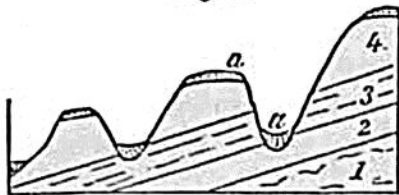


If, then, the entire mass of stratified deposits in the earth's crust is at once the monument and measure of the denudation which has taken place, on how stupendous a scale ought we to find the signs of this removal of transported materials in past ages! Accordingly, there are different classes of phenomena, which attest in a most striking manner the vast spaces left vacant by the erosive power of water. I may allude, first, to those valleys on both sides of which the same strata are seen following each other in the same order, and having the same mineral composition and fossil contents. We may observe, for example, several

Fig. 89.



Valleys of denudation.
a. alluvium.

formations, as Nos. 1, 2, 3, 4, in the accompanying diagram (fig. 89); No. 1 conglomerate, No. 2 clay, No. 3 grit, and No. 4 limestone, each repeated in a series of hills separated by valleys varying in depth. When we examine the subordinate parts of these four formations, we find, in like manner,

distinct beds in each, corresponding, on the opposite sides of the valleys, both in composition and order of position. No one can doubt that the strata were originally continuous, and that some cause has swept away the portions which once connected the whole series. A torrent on the side of a mountain produces similar interruptions; and when we make artificial cuts in lowering roads, we expose, in like manner, corresponding beds on either side. But in nature, these appearances occur in mountains several thousand feet high, and separated by intervals of many miles or leagues in extent, of which a grand exemplification is described by Dr. MacCulloch, on the northwestern coast of Ross-shire, in Scotland.*

Fig. 90.



Denudation of red sandstone on northwest coast of Ross-shire. (MacCulloch.)

The fundamental rock of that country is gneiss, in disturbed strata, on which beds of nearly horizontal red sandstone rest unconformably. The latter are often very thin, forming mere flags, with their surfaces distinctly ripple-marked. They end abruptly on the declivities of many insulated mountains, which rise up at once to the height of about 2000 feet above the gneiss of the surrounding plain or table-land, and to an average elevation of about 3000 feet above the sea, which all their summits generally attain. The base of gneiss varies in height, so that the lower portions of the sandstone occupy different levels, and the thickness of the mass is various, sometimes exceeding 3000 feet. It is impossible to compare these scattered and detached portions without imagining that the whole country has once been covered with a great body of sandstone, and that masses from 1000 to more than 3000 feet in thickness have been removed.

* Western Islands, vol. ii. p. 93, pl. 31, fig. 4.