

neath, it seems to follow as a necessary corollary, that the surface would be unequally elevated and broken into inequalities by the same cause; unless we suppose, that every part presented an equal degree of resistance to the moving force. There must, therefore, have been originally, inequalities or valleys, which determined the direction of the water-courses in the first instance, though the form of these valleys may have been subsequently modified by the action of water. That all valleys have been excavated by the rivers that flow through them, is opposed by many decisive facts. Before their excavation, the water must have had less force than at present, as the fall would be gentle; and the present effect of rivers in large valleys, is not to excavate them deeper, but to fill them with alluvial depositions.

There are numerous deep valleys in the Alps, that are closed at one end by steep mountains or perpendicular walls of rock, and which were originally closed, and are now nearly closed, at the other end also. Such are the valley of Thones, near Annecy, the valley of Chamouni, and on a larger scale, the valley of Geneva. It is evident that the valley of Thones, and that of Geneva, have once been filled with water, and formed lakes: by an earthquake, or by the erosion of water, a fissure has been made, which has drained the greater part of these valleys; but it is obvious that the valleys could not have been formed by the original lakes, or by the rivers that flowed into them. If valleys were formed by the erosion of rivers, the lakes through which these rivers flow, must have long since been filled up by the materials brought into them. To say that the lakes were once deeper than at present, is giving up the theory; for lakes are only the deeper parts of valleys.

Had the valley of Borrowdale, in Cumberland, been excavated by the water that flows from it, the lake of Keswick, at its entrance, must have received all the materials, and been long since choked up. Or had the valley of the Rhone, ten thousand feet deep and sixty miles in length, been excavated by the Rhone, the quantity of matter brought down by this river, would not only have filled the lake of Geneva, into which it empties itself, but the broad valley in which the lake lies, must also have been filled up, and raised to the height of the Jura. That the Lake of Geneva, and all lakes into which large rivers flow, are gradually filling up, has been before stated; but the valley of the Rhone is not, nor are other valleys becoming deeper. The upper part of this valley, as before stated, has evidently been itself a lake, closed in, or nearly so, by the rocks at Martigny.

The action of torrents in Alpine districts may have been sufficient to widen fissures already made, or to scoop out glens, in the softer beds on the sides of mountains; but they appear inadequate to the original formation of large longitudinal valleys. Water-courses running on the edges of nearly vertical beds, may scoop out a portion