

That these valleys were formed before the transportation of the granite blocks, seems evident from the circumstance before stated, that the blocks occur in groups, opposite to the embouchures of all the Alpine valleys, that open into the great valley of Geneva. These valleys or depressions, were therefore formed before the country emerged from the ocean, not by the erosion of rivers, but by the elevation and fracture of the beds on each side. The summits of the mountains that border the present valleys may have directed the course of the rush of water by which the blocks were transported. The valley of the Arve, in the upper part has evidently been a lake or series of lakes, originally formed by elevation and depression : the waters have cut passages through the barriers of these lakes at a subsequent period, and the river Arve has afterwards cut through the deep mass of sand and rounded stones, that fill the bottom of the lower part of the valley, from Bonneville, to the junction of the Arve with the Rhine. The transportation of the granite blocks was posterior not only to the original formation of the Alpine valleys, but also took place at a later period than the deposition of the deep mass of sand and rolled stones, that forms the bed of the lower part of these valleys, for the blocks often rest upon it. Blocks of similar granite may be seen in the lake of Geneva between that city and Thonon, which indicate that this part of the lake has undergone no great change, since these blocks were deposited. The transportation of the granite blocks appears to have been effected suddenly ; but the rounded blocks and sand at the bottom of the valleys, must have been long subjected to the violent agitation of water.

There are numerous instances of transported masses of rock, scattered over our own island, and various parts of the continent, but none of them appear so immediately to elucidate the enquiry respecting the origin of valleys, as the granite blocks in Savoy and on the Jura. Seated on the side of a mountain among a group of these blocks (as on the Saleve, near Geneva ;) you may see, at the same time, the distant rocks from which they were torn, the valleys or depressions along which they have been transported, and the original situations on which they were deposited, and where they remain and may probably continue till another revolution of the globe. By whatever force the granite was torn from the nearly vertical beds of the Alps, the same force, acting on the level secondary strata, might tear off a large extent of surface and uncover the lower beds : this is what is understood by a *denudation*.

The geological student is requested to observe that though I have denominated these transported masses of rock in Savoy, granite blocks, because they are principally granite, yet blocks of the other Alpine rocks are also frequently intermixed with them.