

these marks of abrasion seem capable of enduring for ever. They have been traced in the Alps to great heights above the present glaciers, and to great horizontal distances beyond them.

Another effect of a glacier is to lodge a ring of stones round the summit of a conical peak which may happen to project through the ice. If the glacier is lowered greatly by melting, these circles of large angular fragments, which are called 'perched blocks,' are left in a singular situation near the top of a steep hill or pinnacle, the lower parts of which may be destitute of boulders.

#### *Alpine erratic Blocks on the Jura.*

Now some or all the marks above enumerated,—the moraines, erratics, polished surfaces, domes, striæ, and perched rocks—are observed in the Alps at great heights above the present glaciers, and far below their actual extremities; also in the great valley of Switzerland, fifty miles broad; and almost everywhere on the Jura, a chain which lies to the north of this valley. The average height of the Jura is about one-third that of the Alps, and it is now entirely destitute of glaciers; yet it presents almost everywhere moraines, and polished and grooved surfaces of rocks. The erratics, moreover, which cover it present a phenomenon which has astonished and perplexed the geologist for more than half a century. No conclusion can be more incontestable than that these angular blocks of granite, gneiss, and other crystalline formations, came from the Alps, and that they have been brought for a distance of fifty miles and upwards across one of the widest and deepest valleys of the world; so that they are now lodged on the hills and valleys of a chain composed of limestone and other formations, altogether distinct from those of the Alps. Their great size and angularity, after a journey