

CHAPTER VI.

DENUDATION.

Denudation defined—Its amount equal to the entire mass of stratified deposits in the earth's crust—Horizontal sandstone denuded in Ross-shire—Levelled surface of countries in which great faults occur—Coalbrook Dale—Denuding power of the ocean during the emergence of land—Origin of Valleys—Obliteration of sea-cliffs—Inland sea-cliffs and terraces in the Morea and Sicily—Limestone pillars at St. Mihiel, in France—In Canada—In the Bermudas.

DENUDATION, which has been occasionally spoken of in the preceding chapters, is the removal of solid matter by water in motion, whether of rivers or of the waves and currents of the sea, and the consequent laying bare of some inferior rock. Geologists have perhaps been seldom in the habit of reflecting that this operation has exerted an influence on the structure of the earth's crust as universal and important as sedimentary deposition itself; for denudation is the inseparable accompaniment of the production of all new strata of mechanical origin. The formation of every new deposit by the transport of sediment and pebbles necessarily implies that there has been, somewhere else, a grinding down of rock into rounded fragments, sand, or mud, equal in quantity to the new strata. All deposition, therefore, except in the case of a shower of volcanic ashes, is the sign of superficial waste going on contemporaneously, and to an equal amount elsewhere. The gain at one point is no more than sufficient to balance the loss at some other. Here a lake has grown shallower, there a ravine has been deepened. The bed of the sea has in one region been raised by the accumulation of new matter, in another its depth has been augmented by the abstraction of an equal quantity.

When we see a stone building, we know that somewhere, far or near, a quarry has been opened. The courses of stone in the building may be compared to successive strata, the quarry to a ravine or valley which has suffered denudation. As the strata, like the courses of hewn stone, have been laid one upon another gradually, so the excavation both of the valley and quarry have been gradual. To pursue the comparison still farther, the superficial heaps of mud, sand, and gravel, usually called alluvium, may be likened to the rubbish of a quarry which has been rejected as useless by the workmen, or has fallen upon the road between the quarry and the building, so as to lie scattered at random over the ground.