

ture not much if at all lower than that of tropical regions in the present condition of the earth. Subsequently, the elevatory movements which have operated so variously and powerfully upon the crust of the earth, pushed up the previously horizontal beds, and raised that large district into ranges of mountains considerably higher than is their present state. This effected an extreme reduction of temperature, and established a polar climate. The valleys were filled with stupendous glaciers; which, as do those of the present day, broke off and slowly bore away as along inclined planes, fragments of rock, of all sizes, from that of mere grains to bowlders weighing hundreds of tons. These, by the known progressive motion of those immense masses of frozen snow, were driven over surfaces of denuded rock, in the way of dry grinding. The mechanical results of such an operation, repeated thousands of times, are "written as with the point of a diamond." Grooves, slighter markings, and the interposed small pebbles and fine sand, prove the kind and manner of the operation. In a subsequent period, this great system of mountains sunk down, probably about the average of seven thousand feet. Consequently, the snows must have melted below a certain altitude. In time the valleys were cleared, and the whole face of the country became nearly what it is at present. One of the results was, that the blocks of the Alps are now found on the tops and opposite descents of the Jura mountains, separated from the origin of those blocks by several deep valleys, running crosswise, each ten or fifteen miles in width, and the entire distance at least fifty miles. Several local deluges appear then to have taken place, commencing in some part of the higher Alps. The earlier of these were probably produced from the melting of the snow and ice made redundant by the subsidence of the ground, and the dissolution of which would become very rapid in consequence