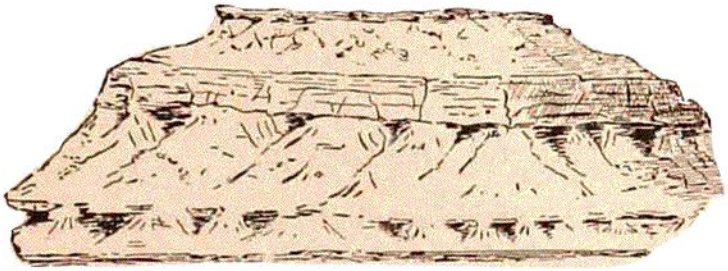
of the moving air; and so it is when the hurricane tears up trees, prostrates forests, unroofs houses, or moves them from their foundations. These destructive effects are dependent, as already explained, not merely on velocity, but also on the extent, form, and position of the object against which it strikes. The adhesion of the hardened mud along the ruts of a country road may not be overcome by a gale that prostrates forests.

Besides lifting and transporting loose sands, the heavier winds tear off grains from exposed ledges or bluffs of rock, which the action of the sun, or oxidation, or saline efflorescences, or other means have loosened, and thus carry on the work of denudation.

2. *By means of the material transported.* — But the sand, gravel, or stones borne by the winds give them their chief denuding power. Attention was first called to this wind work by W. P. Blake, who described the granite of the Pass of San Bernardino, Cal., as scratched like rocks of glacier regions, even quartz and tourmaline being finely polished, and the garnets left projecting on pedicels of feldspar, inclined in the direction of the wind; limestone as eroded and channeled as if by dissolving waters. Mr. Blake observed, further, that the scratching and polishing effects were not confined to the Pass, but were visible over all parts of the Colorado desert to the eastward, where hard rocks were exposed; and he dwells on the great importance of this action of the winds as a means of denudation (1855). Later observers have shown that many of the bluffs, needles, and towers of soft sandstone characterizing the scenery in different parts of the Rocky Mountain region have been more or less shaped by this means. Moreover, scratches made by drifted sand, long since noticed on the glass of windows on Cape Cod, have been observed in Maine where it is not arid (G. H. Stone, 1886). In arid parts of India, according to Mr. R. D. Oldham, they differ from those of glaciers in being deepest at the end facing the wind.

Eolian denudation has its best examples in the Egyptian and other true deserts where the annual fall of water is very small. The following figures of Egyptian denudation are from the work of J. Walther (1891), which treats the subject with great fullness and gives many illustrations, after personal observations. The differences in hardness of the layers determines the rate of wear and leads to nearly the same forms that are produced by running water. In Fig. 155 the beds are Eocene limestone and other kinds. In Fig. 156 Cretaceous beds are upturned, and the harder limestone caps each elevation. The deflation leaves silicified fossils (Exogyra and Corals) projecting over the surface, as in Fig. 156.

155.



Southwest end of Mokkatam. Walther.