

siliceous sand, driven with great velocity, is made to etch or engrave glass.¹¹ The abrading and polishing effects of wind-blown sand have long been noticed on Egyptian monuments exposed to sand-drift from the Libyan desert.¹² Similar effects have been observed on dry volcanic plains of barren sand and ashes, as on the island of Volcano.¹³ On the sandy plains of Wyoming, Utah, and the adjacent territories, surfaces even of such hard materials as chalcedony are etched into furrows and wrinkles, acquiring at the same time a peculiar and characteristic polish. There, also, large blocks of sandstone or limestone which have fallen from an adjacent cliff are attacked, chiefly at their base, by the stratum of drifting sand, until by degrees they seem to stand on narrow pedestals. As these supports are reduced in diameter the blocks eventually tumble over, and a new basal erosion leads to a renewal of the same stages of waste.¹⁴ Hollows on rock-surfaces may also be noticed where grains of sand, or small pebbles kept in gyration by the wind, gradually erode the shallow cavities in which they lie.

As the result of the protracted action of wind upon an area exposed at once to great drought and to rapid vicissitudes of temperature, a continuous lowering of the general level takes place. The great sandy deserts thus produced

¹¹ The student will find much valuable information on this subject in the experimental results obtained by Thoulet, *Comptes Rend. civ.* p. 381. *Ann. des Mines*, 1887; and in the essay by Walther cited below

¹² An excellent account of the denudation phenomena of the Egyptian deserts will be found in an essay by J. Walther in vol. xvi. (1891) of the *Abhand. Königl. Sächsisch. Gesellsch. d. Wissensch.* The polishing of rocks by the sand of the Sahara is described by M. Choisy in his report "*Documents relatifs à la mission dirigée au Sud de l'Algérie*," 1890, p. 327.

¹³ Kayser, *Z. Deutsch. Geol. Ges.* xxvii. p. 966.

¹⁴ See Gilbert in Wheeler's Report of U. S. Geograph. Surv. W. of 100th Meridian, iii. p. 82. W. P. Blake, *Union Pacific Railroad Report*, v. pp. 92, 230. *Amer. Journ. Sci.* xx. (1885), p. 178. Naumann, *Neues Jahrb.* 1874, p. 337. Cazalis de Fondouce, *Assoc. Française*, 1879, p. 646. Many good illustrations are given by Walther in the essay above cited.