rocks and thereby loosening the cohesion of their particles, rain acts mechanically by washing off these particles, which are held in suspension in the little rain-runnels or are pushed by them along the surface. The amount and rapidity of this action do not depend merely on the annual quantity of rain. A comparatively large rainfall may be so equably distributed through a year or season as to produce less change than may be caused by a few heavy rain-storms which, though inferior in total amount of precipitated moisture, descend rapidly in great volume. Such copious rains, by deluging the surface of a country and rapidly flooding its water-courses, may transport in a few hours an enormous amount of sand and mud to lower levels. Another feature to be kept in view is the angle of declivity: the same amount of rain will perform vastly more mechanical work if it can swiftly descend a steep slope, than if it has to move tardily over a gentle one.

Removal and Renewal of Soil.—Elie de Beaumont drew attention to what appeared to be proofs of the permanence or long duration of the layer of vegetable soil.[71] But the cases cited by him are not inconsistent with a belief that the doctrine of the persistence of the soil is true rather of the layer as a whole, than of its individual particles.[72] Were there no provision for its renewal, soil would comparatively soon be exhausted, and would cease to support the same vegetation. This result, indeed, occurs partially, especially on flat lands, but would be far more widespread were it not that rain, gradually washing off the upper part of the soil, exposes what lies beneath to further disintegration. This removal takes place even on grass-covered sur-

[71] "Leçons de Geologie pratique," i. p. 140.
[72] Geikie, Trans. Geol. Soc. Glasgow, iii. p. 170.