The coarser grains transported by the water suffer the most in corrasion, a grain a tenth of an inch thick wearing 10 times as fast as one a hundredth of an inch, and an inch pebble losing more in transportation a few hundred yards than a grain of sand of a thousandth of an inch in drifting for 100 miles (Sorby, 1880). Angular fragments of granite lose more by corrasion than rounded fragments. Ordinary sand-grains become rounded in a similar manner; but those of the finest quartz-flour from glaciers (as that giving the milky tint to the Rhine at Strassburg) remain angular, instead of becoming corraded (Daubrée, 1879).

Shales and soft sandstones yield easily to abrading agents; hard sandstones and quartzytes much less so; basalts, granites, very slowly, unless the wear is promoted by previous decay. Limestones are eroded easily because the material is soft and the waters may dissolve as well as wear away.

Abrasion *assorts in proportion to hardness.* The softer materials first yield, leaving the harder. When granitic sands, made of quartz, mica, and feldspar, are exposed to beach or river action, the mica first floats off, because in thin scales; next the feldspar is reduced in the corrasion to fine earth and is borne away; and the hard quartz is left in grains. Thus at the same time, out of the same sand are made a bed of quartz sand, for a sandstone, and not far off it may be an argillaceous or mud-like bed, good for forming a shale.

Rivers and beaches are thus ever at work when materials of the right kind are at hand. Where the flood-waters of a river, or the tidal-waters of the ocean, flow widely over shelving shores and bordering flats with little depth, the surface water as it moves onward is like a horizontally cutting blade; and, while admitting of deposition up to its level, it shears off the surface with remarkable evenness, making, by this process of planation, flat shore-platforms and flood-grounds or terraces, such as occur along many river valleys and sea borders; and the plains are often at heights which make them evidence of ancient water levels.

Transportation and Deposition.

The rate of denudation depends largely on the velocity of the transporting water. The transporting power increases as the sixth power of the velocity (Hopkins, 1844). With twice the velocity the weight of transportable particles is increased 64 times; or, if the particles are of the same specific gravity, the transportable particles, if the velocity is doubled, may have four times the diameter, or 64 times the weight.

The stones, unless they have the specific gravity of water, are moved mainly along the bottom; and being continuously under the action of gravity, the movement of each, like that of a projected cannon-ball, is in a long curve. It makes a series of leaps, rising from the bottom and returning to it, — the length of the curve varying with the velocity and the specific gravity. The finest of sediment remains long in suspension, giving a cloudiness to waters; and it has been suggested that a partial alteration of the