sometimes far from their place of origin. All rocks, even the hardest, are penetrated by water, which dissolves them, at least partially. Seneca attributes this solvent action to the presence of a gas (*spiritus*). Thermal springs possess the power of dissolving minerals in the highest degree, and among those which offer least resistance he enumerates salt, sulphur, nitre, alum, bitumen, and lime. The matters dissolved by water are deposited again, and this precipitation is especially abundant when the waters are thermal and gaseous. He likewise explains the formation of calcareous tuffs, and points out that the saline substances held in solution by the aqueous element may be absorbed by earthy layers, which, in a way, serve as a natural filter. What has been said above upon the chemical action of water shows that Seneca had clearly recognised those hydrothermic phenomena which play so important a rôle in geology.[1]

Seneca on the Mechanical Action of Water.

His ideas concerning the mechanical action of water are not less just. The hardest rocks cannot resist the destructive effect of a repeated dropping of water, and the erosive effects of water are most pronounced when the forces in play are those of streams, currents, and the waves of the sea, as may be observed in the beds of rivers and on bold coasts. Everywhere water is seen victoriously attacking and destroying rocks; the chemical effects often precede the mechanical. Streams and rivers at all times, but especially during floods, transport clay,sand, and rocks, picked up from the layers which they traverse. The erosive power of waves is, however, even greater than that of running water; cliffs broken and smashed into ruins testify to the work of destruction effected by the sea on coasts. Rivers deposit at their mouths the matter which they carry in suspension, thus forming deltas. In their turn the mineral particles in suspension in marine waters are deposited at the bottom of the sea, often at considerable distances from the coasts. Among the agents which take part in marine sedimentation, tides and currents are enumerated. Seneca points out that all waters, and especially those of the ocean, possess the power of clearing themselves from all impurities; they may, indeed, be said to wash the shores and lay down near them all matters in suspension, so that in the course of centuries the lines of coasts undergo sensible modifications. The surface of the ocean is spherical; its level remains constant in spite of the continuous accession of river-water, nor does the latter modify the saline taste of the sea, and he attributes this constancy in level and saltness to evaporation. At certain intervals, however, the normal height of the ocean undergoes a general but temporary elevation, producing deluges with a sort of periodicity, and causing profound modifications on the surface of the globe. These diluvial inundations do not, however, spread over the whole world; only some regions are thus invaded. Such great phenomena cannot be referred to a single cause; several must unite to produce them, as torrents of rain, earthquakes, and perhaps other causes. The waters of the sea might easily cover the highest moun-

Seneca on the Level of the Ocean.

[1] Dr. Nehring, Die geologischen Anschauungen des Philosophen Seneca, Wolfenbüttel, 1873 and 1876, Theil ii. pp. 10–15.