

hand, finds a fitter station on mountains in which sandstone predominates, where the soil is usually deeper. It would seem to be for a similar reason that the *Beech* grows in many rocky districts, for example, on the Hartz Mountains, at pretty considerable heights, especially on the sides of valleys which run to the south, while these places do not admit the *Oak*, which is found in the middle provinces of Sweden and Norway; while the *Beech*, on the other hand, grows only in the southern parts. From the deficiency of soil, the Upper Hartz can produce neither the *Pinus pinea*, nor *P. sylvestris*; the horizontal roots, however, of the *Abies*, or Norway Spruce, are content with the small portion of earth which covers the greywacke and slate, although they cannot find sufficient hold to protect its lofty trunks from being thrown down by the tempest. In some parts of the Forest of Thuringia, where the covering of loose earth is deeper than in the Hartz, the *Pinus picea*, or pitch pine, grows luxuriantly. The common fir, *Pinus sylvestris*, which attains a great height in proper soil, on the contrary, is stunted and distorted on rocky mountains, where the roots soon come in contact with the rock. It there loses the character of a tree, and assumes that of a shrub, as in place of a single upright stem, several branches shoot out, and these, not unfrequently, are creeping or bent.

The different conditions of rocks, especially their structure and their state of cohesion, are of some importance in producing these effects; for the surface of rocks must be detrimental or impervious to the roots of plants, in proportion to the compactness of their structure, and the cohesion of their parts. Schistose rocks, for example, af-