

Origin of Soil.—As soon as a sedimentary rock appears above the water, or an igneous rock is extruded from the crust, meteoric forces begin to transform it. Wind and water, heat and cold, plants and animals, oxygen and carbonic acid, all unite to disintegrate and dissolve the solid rock, and even to transport much of it to other localities. Water, oxygen and carbonic acid are the chief agents involved in producing chemical change. The ferrous and the manganous compounds, so frequently constituents of igneous rocks, easily take up oxygen to form the more stable peroxids. Sulfids of the metals become soluble sulfates, and these may even lose their sulfuric acid and be precipitated as hydrates, as in the transformation of iron pyrite into limonite. Rain water always contains some carbonic acid, and as it percolates through decaying vegetable matter it soon becomes charged with this powerful solvent. The silicates of lime, soda, potash and iron, so abundant in the crystalline rocks, are easily attacked by this water, carbonates of the bases being formed and silica set free. The crystals of felspar lose their lustre and color, first becoming dull and earthy on the outside, and finally being converted into a soft, pulverulent clay. The rapidity and completeness of the process vary greatly, but usually all of the alkalis and much of the silica are removed. Water charged with carbonic acid is also a good solvent of ordinary limestone, calcium carbonate being carried off and the impurities left behind.

Solution is greatly aided by physical disintegration.