

some little distance below the surface : sometimes it is a difference of colour, sometimes a variation in the roughness, but whatever the difference may be, it is clear to the eye that there is a difference in the character of the soil. The portion that so differs from the surface soil is called the **sub-soil**, or under-soil. In speaking of the upper or surface soil we usually call it the soil, and that portion which lies below it is known as the subsoil.

5. The question naturally arises, how is it that the land is thus covered by this earthy matter, and **whence did the soil come?** Soils are produced by the breaking up or crumbling of rocks. If a rock were reduced into powder either by grinding, or by any other mechanical means, that pulverized rock would be a soil. But soils are not formed by rocks being pulverized by man's industry ; natural agencies carry out this work very perfectly, sometimes with, and at other times without, our co-operation.

6. There are **three agencies** which thus turn rocks into soil, and thereby produce for the farmer the earth from which he makes his crops to grow. Water is one of these agents. If water falls upon or soaks into a piece of rock, it has a tendency to dissolve some portion of the stone, and then pass away with its spoil as soon as other water is ready to take its place. Thus, rocks are softened by **water** and some portions dissolved out of them.

7. Water also acts powerfully because it contains some **atmospheric air** in it. Rain-water in falling through the air takes into, and amongst its particles, some portion of the air through which it passes, and retains it. Thus water has generally some atmospheric air in it. This air is a mixture of two gases—oxygen and nitrogen—with some others in small proportions, but of the latter we now only notice one, carbonic acid.

8. When water carries into a rock the oxygen which it contains, this gas has a tendency to form chemical