

plains partially the fact of the greater and more rapid growth of vegetable life during the summer season, when the days—the period of light in which the plants assimilate carbon and build up their structure—are much longer than in other seasons of the year.

## OXYGEN.

Another of the elementary constituents of organic matter is oxygen, and one of the most generally diffused in nature, though contrary to what some have said, it performs no more important part than any of the other elements. All are necessary; each performing its special part assigned to it; they are all links in the great chain of matter—all parts of

“ One superior Whole,  
Whose body nature is, and God the soul.”

It forms a large part of the atmosphere which surrounds the earth, about eight-ninths of all the water in existence, besides forming a very large proportion of rocks, minerals and soils. In water it is in chemical union with hydrogen, and in the air it is only mechanically mixed, not chemically combined with nitrogen, both elements of organic matter hereafter to be described; but in soils and rocks it is combined with various bodies, affecting their properties in a very great degree. In its pure state it is invisible, colorless, tasteless, and without smell. It has a very strong affinity for almost all bodies, and the compounds thus formed are called either Acids or Oxides. The *act* of combining with oxygen is called *oxidation*, the former of these possesses the general properties of acids; the latter of bases, which by uniting with the former produce salts;\* thus sulphur and oxygen in certain proportions form sulphuric acid or oil of vitriol. Calcium and oxygen in certain proportions form lime, a base which when united to the sulphuric acid produces a salt (sulphate of lime or gypsum.) The phenomena attending oxidation are very variable. Ordinary combustion is only oxidation taking place in a rapid manner; then again it takes place slowly without any manifest development of effects, as when iron, zinc, or copper rusts. The burning of wood and the rusting of iron are both examples of oxidation; in the one case occurring more rapidly than in the other, and in each oxygen is obtained from the air. Another instance of slow oxidation is the gradual decay, or slow combustion, (*Eremacausis*, as it has been termed by Baron Liebig,) of organic matter when exposed to the air. By it all organized bodies are resolved into forms capable of being used as food for plants. It is this gas which when breathed supports animal life, and almost all changes in animate or inanimate nature take place in consequence of its increase or diminution.

\*Hydrogen is also essential to give sulphur acid properties.