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 oxydation are very variable. Ordinary combustion is only oxydation 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 oxydation; in the one case occurring more rapidly than in the other; and in each oxygen is obtained from the air. Another instance of slow oxydation 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.—This is also one of the four organic elements. Like oxygen, it is very extensively diffused throughout all nature; like it, it is a gas invisible, tasteless and inodorous. It is the lightest body in nature, and hence used for filling balloons. It is never found isolated, but always in union with some other body. With oxygen it forms water, and with carbon the gas so generally used for light. It is very combustible, and when burned by means of the hydro-oxygen blowpipe, (an invention of the celebrated Dr. Hare, of Philadelphia,) produces the most intense heat yet known.

Nitrogen—Like hydrogen and oxygen, when combined, always exists in the gaseous state, and like them is tasteless, colorless and without smell. It forms about four-fifths of the atmosphere, a small proportion of vegetable, and a large share of animal matter. It has in its pure state no very sensible and direct properties, and is better known by those which are negative. It does not support combustion, but extinguishes all burning bodies that are surrounded by it alone, and no animal can live in it when pure, though it has no deleterious properties; combustible matter refuses to burn, and the animal dies because deprived of oxygen, or vital air. It serves as a diluent to moderate the action of the oxygen in the air which we breathe, for no animal can live but a short time in this latter gas; and if nitrogen was not present in the air, in a short time not only would trees and forests, but also iron and all other metals, be burned in one general conflagration. When combined with hydrogen, this substance forms ammonia, so necessary to the formation of vegetable and animal life, and that which constitutes the chief valuable constituent in Peruvian guano.

* Hydrogen is also essential to give sulphur acid properties