

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 uncombined, always exists in the gaseous state, and like them it 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 itself, 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. This substance, a product of the decomposition of organic matter, always exists in small quantities in the air, whence it is brought down by dew, rain and snow to the earth, where it is retained for the use of the plant. Although nitrogen exists so abundantly in the air, and forms so large a portion of plants, yet they cannot use it in its pure form; it must be supplied to them in the form of ammonia, or of nitric acid, as some say. Their leaves imbibe and exhale, but use it not. The experiments to support the contrary idea are inconclusive, as all their results can be explained without coming to the conclusion that nitrogen, as such, is supplied directly to plants from the air.

I have now given the most marked properties of the four elementary organic substances which form the air we breathe, the waters of the earth, a large part of the earth, itself, and of the animal and vegetable tribes which inhabit it. Their names and