

Far the greatest part of the plant produces the volatile matter, consisting of Carbonic Acid, Water and Ammonia, three substances which can be farther divided into their elementary constituents: Carbon, Hydrogen, Nitrogen and Oxygen.

These single substances, are the fundamental constituents of all organic bodies; and plants must therefore be constantly supplied with them whilst the processes of life continue to take place in them.

Animals live on both vegetable and animal food, and are consequently referred to, and supported by the vegetable kingdom; they could not exist before vegetation covered the lifeless mineral crust of our globe. Plants, on the other hand, must necessarily assign to themselves food of far more simple constitution. When they first made their appearance, they did not find any thing else offered to them for food, but what already existed as constituent parts of the atmosphere, and earth.

In accordance with this, our daily experience teaches us, that the wants of plants are supplied by both these media, viz: that the forms in which the plants assimilate their Carbon, Hydrogen, Nitrogen and Oxygen, are those of Carbonic Acid, Water and Ammonia, contained in, and furnished by, the air; and that, on the other hand, the forms in which the plants assimilate the constituents of their ashes, are those of Silicates, Phosphates, Sulphates, Chlorides, alkaline, and earthy salts, as contained in, and furnished by, the soil.

The latter position cannot be doubted; no other source exists for the supply of mineral substances, but the earth. As to the former however, that Carbonic Acid, Water and Ammonia, are the only forms which supply the organic constituents of plants, it has been often opposed, and is still opposed by many at the present day.—it is a fact that the productiveness of soils is somewhat influenced by the quantity of Humus contained in them, and accordingly the principal objection made against our theory is this, viz: that Humus is assimilated by the plants in form of Humus, and thus participates directly in the formation of the organic parts of plants, or, in other words, plants live on organized bodies.

We have no reason to adopt a theory which is not only strongly opposed to natural philosophy, but which is also positively contradicted by facts. We see plants growing and becoming developed in a soil which neither contains Humus, nor any substance of organic origin. This occurs in many parts of our globe, and is also confirmed by direct experiments, upon soils which before being used, had been calcined, and thus deprived of all organic matter.

On the other side, the plant is not able to appropriate to itself and to assimilate its constituents, in their isolated, elementary form; for a plant which is planted in pure charcoal, and surrounded by an atmosphere of Hydrogen, Nitrogen and Oxygen, will soon die for want of suitable nourishment.