

deed, but they were exceedingly stunted in their growth, and evidently derived little or no sustenance from the water with which they were supplied. Experiments of a similar nature were made by Bonnet, and with the like result. When plants are contained in closed vessels, and regularly supplied with water, but denied all access to carbonic acid gas, they are developed only to a very limited extent, determined by the store of nutritious matter which had been already collected in each plant when the experiment commenced, and which by combining with the water, may have afforded a temporary supply of nourishment.

But the water which nature furnishes to the vegetable organs is never perfectly pure; for, besides containing air, in which there is constantly a certain proportion of carbonic acid gas, it has always acquired by percolation through the soil various earthy and saline particles, together with materials derived from decayed vegetable or animal remains. Most of these substances are soluble, in however minute a quantity, in water: and others, finely pulverized, may be suspended in that fluid, and carried along with it into the vegetable system. It does not appear, however, that pure carbon is ever admitted; for Sir H. Davy, on mixing charcoal, ground to an impalpable powder, with the water into which the roots of mint were immersed, could not discover that the smallest quantity of that substance had been, in any case, absorbed.\* But in the form of carbonic acid, this element is received in great abundance, through the medium of water, which readily absorbs it: and a considerable quantity of carbon is also introduced into the fluids of the plant, derived from the decomposed animal and vegetable materials, which the water generally contains. The peculiar fertility of each kind of soil depends principally on the quantity of these organic products it contains in a state capable of being absorbed by the plant, and of contributing to its nourishment.

\* Elements of Agricultural Chemistry, Lect. VI. p. 234.