

pears to be proportionate to the number of stomata which the plant contains. It is a process which takes place only in a living plant; for if a leaf be bruised so as to destroy its organization, and consequently its vitality, its substance is no longer capable either of decomposing carbonic acid gas under the influence of solar light, or of absorbing oxygen in the dark. Neither the roots, nor the flowers, nor any other parts of the plant, which have not this green substance at their surface, are capable of decomposing carbonic acid gas: they produce, indeed, an effect which is in some respects the opposite of this; for they have a tendency to absorb oxygen, and to convert it into carbonic acid, by uniting it with the carbon they themselves contain. This is also the case with the leaves themselves, whenever they are not under the influence of light; thus, during the whole of the night, the same leaves, which had been exhaling oxygen during the day, absorb a portion of that element. The oxygen thus absorbed enters immediately into combination with the carbonaceous matter in the plant, forming with it carbonic acid: this carbonic acid is in part exhaled; but the greater portion either remains attached to the substance of the leaf, or combines with the fluids which constitute the sap: in the latter case it is ready to be again presented to the leaf, when daylight returns, and when a fresh decomposition is again effected.

This reversal at night of what was done in the day may, at first sight, appear to be at variance with the unity of plan, which we should expect to find preserved in the vegetable economy; but a more attentive examination of the process will show that the whole is in perfect harmony, and that these contrary processes are both of them necessary, in order to produce the result intended.

The water which is absorbed by the roots generally carries with it a certain quantity of soluble animal or vegetable materials, which contain carbon. This carbon is transmitted to the leaves, where, during the night, it is made to combine with the oxygen they have absorbed. It is thus