

cells. It is of interest to note, however, that the ability of plants to use the gases which have thus penetrated their structure, is dependent upon certain important conditions, viz :—1st, a favorable temperature, (2) the presence of the ordinary green coloring matter of plants—the chlorophyll—and (3) the direct influence of sunlight, or at least of its luminous rays. Neglecting further consideration of temperature which is essential to all functional activity, it should be pointed out that plants devoid of chlorophyll, such as mushrooms and other colorless plants, are incapable of obtaining carbon from the atmosphere. They are therefore forced to obtain their supply of this important element either from other plants upon which they feed as parasites, or from the organic products of decay, upon which they feed as saprophytes. Moreover, the power of green plants to appropriate carbon and liberate oxygen is arrested under conditions of darkness—as at night—when the mode of growth is precisely the same as in colorless plants.

The whole relation of light to the appropriation of carbon, is one of the most interesting with which the physiologist has to deal, but it would lead us too far from our present purpose were we to consider it more in detail, though it may be as well to point out that, if ordinary white light be replaced by such luminous rays, as the orange and yellow, this function is not impeded in any way ; while on the other hand, the rays of higher refrangibility such as the blue, indigo and violet, arrest this function and thus bring ordinary green plants under abnormal conditions of growth, in which functional disturbance is the unavoidable result.

In this particular connection, it only remains for us to indicate what changes take place when carbon dioxide is taken up by the leaves. Under the influence of chlorophyll this gas suffers decomposition. The liberated oxygen returns to the atmosphere, while the carbon, uniting with the elements of water already present, becomes transformed into starch, sugar and oils,—substances which not only provide for the nutrition of growing parts, but, when formed in