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? WHY THE WEATHER ?

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AUTUMN COLORS

The coloring of leaves in the fall is not, as many people suppose, the result of the first sharp frost. It is a chemical process, favored by gradual cooling rather than sudden cold. Through the season of growth the leaves serve as food factories for the trees. In their tiny cells the carbon of the air is combined with materials brought up by the sap from the roots to form starch, sugar and other substances by which the whole tree is fed. The food-making process is performed by sunshine with the aid of a substance called chlorophyll, or leaf green. Chlorophyll is a mixture of several pigments, or coloring matters. One of these is green, and gives the leaves their ordinary color. Another is yellow and is the same substance that, on account of its abundance in growing grass, makes butter particularly yellow in the spring.

When the cool weather sets in and the growth of vegetation slows down, the trees need less food, and gradually suspend work in the leaf factories. Both the food and the chlorophyll in the leaves are drawn into the body of the tree and stored up for use in the spring. This transfer involves many chemical changes. One of them is the breaking up of the chlorophyll into the substances of which it is composed. The green pigment passes out of the leaves before the yellow. Thus yellow becomes one of the prevailing hues of autumn foliage.

The reds, which also prevail in the autumn, do not come from the chlorophyll, but from the pigments contained in the sap. Their appearance indicates an excess of sugar in the leaves, after the withdrawal of other materials. It is supposed, also, that the reddening of the leaves protects the food materials during their passage into the tree from the harmful effects of strong light. The same red coloring is seen in the buds of many plants in spring, where it probably also serves a protective purpose.

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