

It is true that the autumn colors, with all their beauty, are those of death and decay. They are in fact the swan song of the leaves. But this death and decay are not due to frost. The leaves know that their hour has come without any such reminder, and of their own accord, as it were, they prepare in truly royal fashion to leave the stage.

In this preparation there is a general breaking up of the elements which compose the foliage, and this is what causes the change of color. Yellow, the commonest of the autumn colors, is produced by the decomposition of the summer's green. The chlorophyll, which imparts this green color to all plants, is made up of two substances, one bluish and the other yellow, and in autumn when the leaf is getting ready to die, these two substances are separated. The blue disappears and the yellow remains to give its color to the foliage.

The origin of the red color is not so well understood, but it is believed to be produced by the waste mineral matter which collects in the tree during the summer. This is taken up by the roots in the water which it is their business to supply to the tree, and is stored chiefly in the leaves, where it is very much in the way, but partly through the whole tree. Now before the leaves fall the tree takes from them everything it wants to keep and gives to them everything it wants to get rid of, and the collection of all this waste matter in the leaves has much to do with their coloring. For this reason the color is most beautiful after a rainy summer, provided the fall is of the right kind. In rainy seasons there is more water for the roots to take up, and the more water taken into the tree, the more waste matter is stored up to color the leaves in fall.

The only color that the frost has anything to do with is dark brown. When the delicate cells of the leaves are frozen they die and turn brown.

With the fall of the leaf the frost has equally little to do. Trees shed their leaves in countries where it never freezes, and in the North a great many fall before the frost comes. Neither is it the autumn winds that make them fall, though both they and the frost help a little. A wind strong enough to blow the leaves off would take the twigs too and very likely uproot the tree.