

growth so much depends, but all are equally important in one sense. The starch and sugar are there as the materials that the plant is to make its tissues out of, and those tissues when made, have the power of forming new cells. They may be divided into two sets or kinds, those that have particular functions or work to do, and those that produce new cells.

Now take the apple tree. In the stem of the tree you have a number of tubes passing up which do not increase, they are there for the purpose of allowing the sap to pass up outside the woody circle, and between that and the bark there are cells which have the power of forming new cells, and as long as they are there and the plant is drawing up nourishment from the root or by its leaves, a new circle of wood will be formed every year. Now the cells are only at this point and your success in grafting depends upon the uniting of the graft to the wood, upon the bringing of these active cells into contact. Cells then are devoted to different purposes. In the case of the fruit of the apple we have what? The material of the apple is not *produced* in the apple itself, but in *the leaf*, and in proportion to the leaf surface is the capacity for forming this organic matter, consisting, as I have said, of starch, sugar, also acids giving flavor to the apple. The fruit is in fact but a storehouse for this organic material.

Now there is one point in which the protoplasm is of very great importance, or rather, as I should say a knowledge of its character is of very great importance to the fruit grower. Take the question of the transport and preservation of apples, and the one lesson I wish to inculcate to-night is that in dealing with the tree and with the apple we are dealing with something alive, a living being, with something we should treat as we would a living animal and not dead matter; it is in an *active* state, it is undergoing *change*. What does that depend on? Can we make the change slower or hasten it? We all know we can. What is the cause of it? If you take apples or pears and put them into a hot room they ripen and decay sooner than if kept in a cool place. What is the reason? It is the protoplasm that explains all this. If we notice the movements of the protoplasm in the cell of any part of a plant we will see it producing certain effects, we will see how it acts and is acted upon by heat, light, electricity, &c. Take an apple tree, see this material in the cell, this protoplasm, let the seed of the plant