

of June, or excessive accumulation of starch in the bark during active growth, they at once become certain and most important indications of disease.

As in the early period of vegetation, the nutritive and assimilative functions are nearly balanced, there is no surplus material to be deposited. As the season advances, growth diminishes and the products of assimilation then become in excess, in which case they are stored up—most generally in tissues which have long since lost their power of growth—and are therefore designated as permanent, though sometimes in tissues still active, but specially modified as reservoirs of reserve material. These reservoirs represent different tissues and organs in different plants. In the potato, it is the tuber itself; in the lily, it is the modified leaves forming the scale of the bulb; in the carrot, it is the root; and in the century plant, it is each leaf, which becomes specially modified for that purpose. Our particular purpose, however, will be best illustrated by confining our attention to trees and other plants in which the woody structure is largely in excess. Here the distribution of the starch for storage is determined first of all to the pith, next to the medullary rays and woody cells, and last of all to the bark, thus being correlated to the activity of the tissues themselves. In trees, the deposition of starch may be regarded as commencing somewhat late in the season, and increasing, as growth diminishes, to the time when the function of the leaves ceases.

No law can as yet be stated concerning the amount of starch which should normally be deposited in the various tissues, but as the result of examinations into the histological condition of several thousand specimens taken from a great variety of trees and shrubs, examined at all seasons of the year, the following conclusions appear to be justified:—

1. While, in general, plants store reserve material at the close of the growing season, this law cannot find specific application in all cases and for all tissues.

2. Woody plants generally contain reserve material in their permanent structure during the period of active growth, but the presence of starch in the cortical tissues during this time is variable in different species, and depends upon the special physiological functions of the subject.