

ject only to a daily periodicity, due to alternation of day and night. As fast as formed, the starch is disposed of in two ways:—

(1) It is transferred in a soluble form to all the actively growing parts of the plant to meet the immediate requirements of growth. So long, therefore, as vegetation, or the extension of tissues is active, the bulk of all the starch produced is at once disposed of in this way, and there is therefore no excess, but all the tissues show a marked absence of it. This is particularly true during the first one or two months of spring and summer, the solution of the stored starch commencing at a period which antedates the first growth; but as the season advances, maturity of parts replaces rapid extension, and then there is a tendency for the starch to be formed in excess of the immediate demands of growth, and it therefore requires to be disposed of otherwise.

(2) The starch produced in excess of immediate needs is transferred in a soluble form to parts of the plant which have generally lost their power of growth and which contain no chlorophyll, and is there deposited until required by the growth of organs at some future period, generally before the leaves have reached that stage of development which will permit of their assimilating new material. In accordance with this it is generally found that there is comparatively small accumulation of starch in the leaves and other assimilating tissues, while any excessive development there becomes at once indicative of disordered function.

It is impracticable to place a quantitative limitation upon the amount of starch which may normally be present in tissues, and apply that law to all periods of vegetation; the limit can only be established as a matter of experience, since in early summer, when growth is most active—the requirements of tissue-formation keeping pace with the power to supply—the tissues all contain a minimum of starch; but toward the end of summer, as growth ceases, there is a tendency to greater accumulation in all the tissues. At the end of the season, as the leaves ripen previous to their annual fall, whatever starch they contain is either withdrawn to the permanent structure of the plant, or it enters into fatty degeneration. Such changes are normal. If, on the other hand, such accumulations or fatty degenerations occur at other than their normal period, or if in excess at this time, as fatty degeneration during the month