tendency in this direction. I am able to confirm this observation as regards 1912 and 1913. This last year, the plant has retained practically all its leaves except those on the outermost new shoots. It would have occasioned less surprise if the change in tendency of leaf shedding has moved in the opposite direction. I find in this plant also, that a partial abscission layer was formed.

The indefinite prolongation of green foliage in plants which show definite periodicity in temperate regions is not difficult to attain under experimental conditions. Flammarion (26) caused seedlings of *Quercus robur* to retain their leaves by transfer to a greenhouse. By removing the lower leaves from a shoot, Dingler (27) was able to postpone abscission of its upper leaves The age of the organ thus enters in as a factor. The cotton plant in the open field begins to show a decreasing activity in mid-summer, even in mid-Alabama. The exact date in 1911 at Auburn was August 14th. When kept under constantly favourable conditions, as in a greenhouse, its period may be prolonged very greatly. I have grown it for over a year, without any evidence that it could not have been kept in activity for a still longer period. The guayule, *Parthenium argentatum*, and its congeners, *P. hysterophorus*, *P. lyratum* and *P. incanum*, may be similarly controlled. The shrubby species show a periodicity related to rainfall in their natural habitat (the Chihuahuan Desert), but it was found possible in the driest part of a very dry year to stimulate the plant to renewed growth by cutting back the branches, thus showing that the moisture supply alone was the limiting factor, and when the balance between outgo and income was disturbed in favour of the latter, growth became possible. *Ampelopsis Veitchii* normally sheds tendrils only at the close of the season, but I found them being shed during dry weather from plants which spread over boulders (New York Botanical Garden, July, 1913) and were so exposed to high temperature and isolation. Such examples very much strengthen the view that the periodic phenomena of growth and leaf-fall stand in a delicate relation to the environmental factors, a disturbance in any one of which is sufficient to induce a change in behaviour. The analysis of this relation is possible only, as Klebs has said, by experimental means. We may, therefore, profitably examine this aspect of our problem, in order to see what results are at present available.

THE RELATION OF ABSCISSION TO EXTERNAL FACTORS.

The intricacy and much detail of the work which has been done, far too little as it, at present, may be, will prevent more than a rather curtailed summary, but sufficient, it is hoped, to direct attention to the chief results.