ably resemble Cycads in the structure of their stems. Their long rigid narrow leaves may be compared to single pinnæ of the leaves of Cycads. Their cord-like rootlets, as I have ascertained by actual comparison, are similar to those of Cycads. If their fruit was of the nature of *Cardiocarpum* or *Trigonocarpum*, this also would correspond. They differed principally in the division of the stem below into those remarkable underground branches, the *Stigmariæ*, and in the great upward extension and, in some instances at least, ramification of the stem. The former may be regarded as a special modification connected with their peculiar habitat. The latter may be interpreted as a modification either tending backward to the Lycopodiaceæ or forward to the Coniferæ. Since, so far as we at present know, the ramification prevails chiefly in the lower forms, the former may be the more correct view. It is even possible that the *Sigillariæ* may include forms bridging over the space between the higher Acrogens and the Gymnosperms. Viewed in this way, the typical ribbed *Sigillariæ* point downwards through *Calamodendron* and *Calamites* to the Equisetaceæ, and the *Favularia*- and *Clathraria*-types point through *Lepidophloios* and *Lepidodendron* to Lycopodiaceæ. In the upward direction their affinities point both towards Conifers and Cycads. As our knowledge of the structure of individual species of *Sigillaria* increases, we may hope more certainly to trace the links of these affinities. It is, however, to be observed here, by way of caution, (1) that, of the plants reckoned among the several genera or subgenera of *Sigillariæ*, some may eventually prove to be gymnospermous and some cryptogamous, and (2) that, as we shall find in the next group to have been actually the case, some of these plants may, with a cryptogamous fructification, have presented a structure of stem more complex than that found in modern plants of similar grade.

2. Calamodendron and Calamites.

Calamites are among the most abundant fossils of the Carboniferous period, and occur also in the Devonian; and from their peculiar habitat and mode of growth, they are not only preserved as flattened stems, but also occur in immense numbers standing on the beds on which they grew.

They have naturally been regarded from the first as allied to Equisetaceæ; and this opinion is ably and, indeed, conclusively maintained by Schimper in his recent work*, and has been illustrated by the recent description of the fruit by Mr. Carruthers. Difficulties have, however, arisen from the fact that some stems regarded as Calamites have been found to be surrounded by a thick woody cylinder composed of discigerous and pseudo-scalariform tissue, similar to that of the type of *Sigillaria* above described. Some botanists have regarded these last as distinct from the true *Calamites*, and have placed them in the genus *Calamitea*, Cotta, or *Calamodendron*, Brongniart; and Williamson has recently proposed

* Paléontologie Végétale.