distinguish the structures characteristic of the subgenera of *Sigillaria*, or absolutely to separate these from those of certain peculiar conifers on the one hand and from those of the higher acrogens on the other. Young and succulent stems of *Dadoxylon* may have much resembled *Sigillaria* in their structure. Young stems of *Sigillaria* proper may have approached closely to those of *Favularia*; and since I have shown* that the branches of *Favularia* resemble *Clathraria* in their scars, this last may have presented a still feebler type of internal organization. Further, there is, as I have already stated, reason to believe that some of the species referred by palæobotanists to the *Clathraria*-division are really forms of *Lepidophloios*. These difficulties, in connexion with the defective state of preservation of specimens, may excuse many differences of opinion, though I think the facts already stated in this paper are sufficient to put all students of the subject on the right track in regard to at least one leading type of these plants, and to remove some of the more fruitful sources of error.

We may now proceed to inquire what light the structures of *Sigillaria* throw on its affinities. On this question, taken in its most general aspect, there have, I believe, in modern times been only two opinions, the views as to alliance with *Euphorbiæ* and *Cacti* held by some older botanists having been given up. Some botanists, conspicuous among whom is Brongniart, hold that *Sigillariæ* were gymnospermous plants, allied to Cycadaceæ. Others are disposed to regard them as acrogens, and as closely related to Lycopodiaceæ.

In favour of the latter view may be urged the apparent association with *Sigillaria* of certain strobiles resembling those of *Lepidophloios*, the points of resemblance between the tissues of *Favularia elegans* and those of *Lepidodendron*, and the resemblance of certain *Sigillariæ*, or supposed *Sigillariæ*, of the *Clathraria*-type to *Lepidophloios*.

In favour of the former view, we may adduce the exogenous structure of the stem of *Sigillaria*, and the obvious affinity of its tissues to those of Conifers and Cycads, as well as the constant association with trees of this genus of the evidently phanerogamous fruits known as *Trigonocarpum* and *Cardiocarpum*. On the other hand, the resemblance to *Lepidodendron* may be shown to depend merely on comparisons of a part of the tissues of *Sigillaria* with those of that genus. Grave doubts may also be entertained as to whether strobiles of *Lepidophloios*, and even stems of that genus have not been improperly mixed up with *Sigillaria*.

It is probable that all botanists who have studied these plants, might agree that, if not Gymnosperms, they at least present points of affinity with them, and might be regarded as in some sense a link connecting them with Acrogens. Supposing this much to be admitted, important questions remain as to their possible relations to the modern Conifers and Cycads. The higher *Sigillariæ* unquestion-

* "Conditions of Deposition of Coal," Quart. Journ. Geol. Soc. vol. xxii. p. 130.