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Sternbergiæ.—The fine specimen of the axis of an erect Sigillaria already referred to shows that the pith of these trees was of that transversely laminated character which gives rise to the fossils known as Sternbergiæ. Hence we may suppose that some at least of the numerous casts of Sternbergiæ found in the Coal-formation have been derived from Sigillariæ; but this can be ascertained only by a careful microscopic examination of the remains of woody matter clinging to the casts. The results of the study of a cousiderable number of specimens may be stated as follows :—

(a) As Prof. Williamson and the writer have shown, some of these Sternbergia-piths belong to coniferous trees of the genus Dadoxylon. Plate VII. fig. 1 represents a beautifully preserved cylinder of this kind enclosed in the wood of Dadoxylon materiarum.

(b) A few specimens present multiporous tissue, of the type of *Dictyoxylon*, which, according to Williamson, has a *Sternbergia*-pith. Plate VII. fig. 4 affords an instance of this.

(c) Other examples show a true scalariform tissue, comparable with that of Lepidophloios or Lepidodendron, but of finer texture. Corda has shown that plants of the type of the former genus (his Lomatophloios) had Sternhergia-piths. Some plants of this group are by external characters loosely reckoned by botanists as ribless Sigillariæ (Clathraria); but I believe that they are not related even ordinally to that genus. Plate VII. fig. 5 represents a Sternbergia, with tissue partly reticulated and partly scalariform. Plate VIII. fig. 7 represents a specimen with true scalariform tissue. Plate VIII. fig. 6 is a scalariform vessel of Lepidophloios drawn to the same scale for comparison. It will be seen that it is of much coarser texture.

(d). The majority of carboniferous Sternbergiæ show structures identical with those described above as occurring in erect Sigillariæ. Such Sternbergiæ and their structures are represented in Plate VII. figs. 2 and 3, and Plate VIII. figs. 8, 9, 13. Fig. 8 is a reduced section of a large flattened tree, apparently a Sigillaria with Sternbergia-pith (fig. 9), of great beauty, and not dissimilar from those sometimes found in the erect Sigillariæ. The tissue enclosing it was unfortunately imperfectly preserved, but had three rows of pores (fig. 9a).

Structures in Coal.—The constant association of Sigillaria with the beds of coal, in the underclays, in the roof-shales, and in the coal itself, is too well known to require any detailed reference; and the inevitable conclusion that the Sigillaria were the principal plants concerned in the accumulation of the mineral fuel of the true coalmeasures is generally accepted by geologists. It would naturally follow from this that tissues of Sigillaria should be more abundant in the coal than those of other plants. Accordingly, as I have shown in my paper on the "Structures in Coal," and on the "Conditions of Coal-deposition," tissues similar to those above described are those which actually occur most abundantly in the mineral charcoal of the coal-seams. That of the liber or fibrous bark is perhaps the most abundant of all, and that of the woody axis the next in frequency of occurrence.