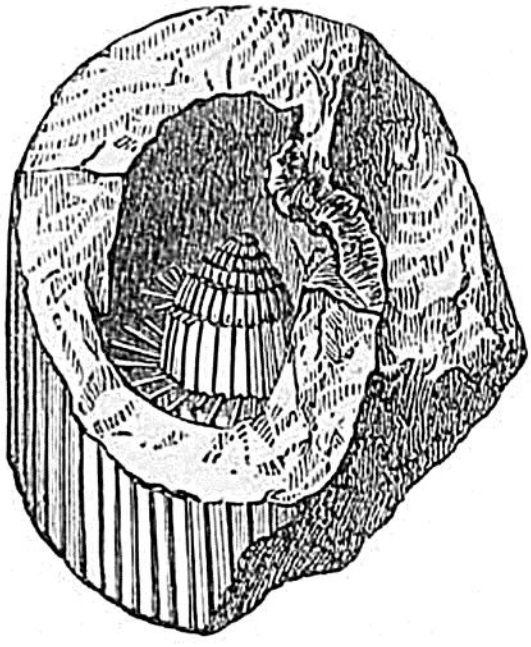
Calamites cannot belong to the *Equiseta*, nor probably to any tribe of flowerless plants. He conceives that they are more nearly allied to the Gymnospermous Dycotyledons. They possessed a central pith, surrounded by a ligneous cylinder, which was divided by regular medullary rays. This cylinder was surrounded in turn by a thick bark. Of fossil stems having this structure Brongniart formed his genus *Calamodendron*, which includes many species referred by Cotta, Petzholdt, and Unger, to the genus *Calamitea*. The *Calamodendron* is described as smooth externally, its pith being articulated and marked with deep external vertical striæ, agreeing, in short, with what geologists commonly call a Calamite. Since the appearance of Brongniart's essay, Mr. E. W. Binney has made many important discoveries on the same subject; and Mr. J. S. Dawes has published (Quart. Journ. Geol. Soc. Lond. 1851, vol. vii. p. 196) a more complete account of this singular fossil. Their views have been confirmed by Prof. Williamson of Manchester, who has communicated to me a specimen, figured in the annexed cut (fig. 478), in which we see an internal pith answering in character to the Calamodendron, and yet having outside of it another jointed cylinder vertically grooved on its outer surface, so that in the same stem we have one calamite enveloping another. Yet that they both formed part of the same plant, is proved by the following circumstances:—1st. Near each articulation of the pith, radiating spokes are seen to proceed and penetrate the ligneous zone. One complete whorl or circle of these radii is visible in the annexed figure near the bottom of the hollow cavity, whilst another and superior whorl is incomplete; several radii, corresponding to the first, remaining, while the rest have been broken away, their place being shown by scars which they have left. 2dly. In addition to these whorls, called medullary by Prof. Williamson, there are seen in other specimens a set of true or ordinary medullary rays. 3dly. The woody zone, penetrated both by the spoke-like vessels beforementioned and by the medullary rays, is usually reduced to brown carbonaceous matter, preserving merely a tendency to break in longitudinal slips, but in some specimens its fibrous tissue is retained, and resembles that of *Dadoxylon*. 4thly. Outside of this zone again is another cylinder, supposed to have been originally a thick cellular bark, nearly equal to one-third of the whole stem in diameter, grooved and jointed externally like the pith.

Fig. 478.



Portion of a *Calamite*, near the base, showing the external cylinder, connected by radiating vessels with the cast of the pith. Its position inverted to allow the light to enter the cavity.
Communicated by Prof. W. C. Williamson.