

stem from the Erian of New York, there is also a special arrangement for support, consisting of a series of peculiarly arranged radiating plates of scalariform vessels, not exactly like those of an exogenous stem, but doing duty for it (*Asteropteris*).*

Similar plants have been described from the Erian of Falkenberg, in Germany, and of Saalfeld, in Thuringia, by Goepfert and Unger, and are referred to ferns by the former, but treated as doubtful by the latter.† This peculiar type of tree-fern is apparently a precursor of the more exogenous type of *Heterangium*, recently described and referred to ferns by Williamson. Here, again, we have a mechanical contrivance now restricted to higher plants appropriated by these old cryptogams.

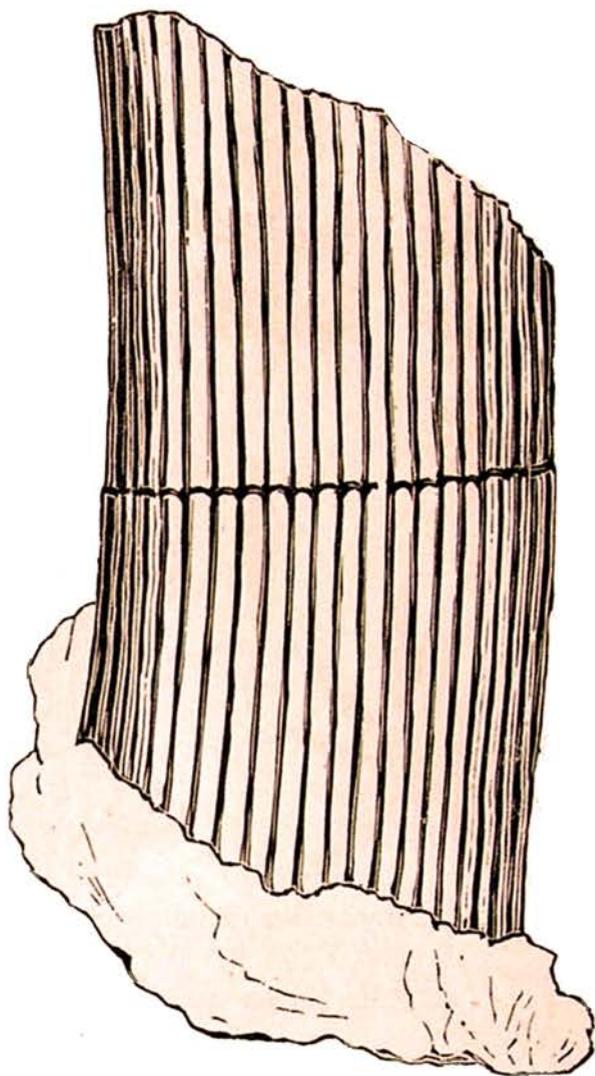


FIG. 27.—*Calamites radiatus* (Erian, New Brunswick).

The history of the ferns in geological time is remarkably different from that of the Lycopods; for while the

* "Journal of the Geological Society," London, 1881.

† "Sphenopteris Refracta," Goepfert; "Flora des Uebergangsbirges." "Cladoxylon Mirabile," Unger; "Palæontologie des Thuringer Waldes."