and flattened at the top, exactly as somewhat strong fistulous stems would be. It is obviously impossible that casts of medullary cavities could be preserved in this manner. Neither *Sternbergiæ* nor casts of the pith of *Calamodendra* ever occur under such circumstances.

3. The stems of *Calamites* may be seen to have produced leaves and branchlets in such a manner as to prove that they are complete stems preserving their external surface. In my paper on the South Joggins, I figured and described the leaves of *C. Cistii* as seen attached to the erect stems. I have since, in 'Acadian Geology,' figured those of *C. Suckovii*, found under similar circumstances; and I have specimens which appear to me to verify the figure given by Lindley and Hutton of the leaves of *C. nodosus*. I have also obtained beautifully preserved specimens of the leaves of *C. transitionis*, a species common to the Devonian and Lower Carboniferous. It has been supposed that the scars on the nodes of *Calamites* are merely the marks of bundles of vessels passing from the interior towards the surface; but it is obvious that, in the case of stems actually producing leaves and branchlets, this cannot be the true explanation, though after seeing the very instructive slices of Prof. Williamson's *Calamopitus*, kindly shown to me by him, I am prepared to admit that in some specimens, at least, they may represent the "medullary radii," which, as already stated, sometimes appear *in addition to* the true vascular scars.

4. The leaves of *Calamites* were not, as is often stated, identical with those of *Asterophyllites*; and the genus *Calamocladus*, in which Schimper has placed many plants of the latter genus, is therefore altogether unnecessary. A careful microscopic examination of the leaves which I have found attached to Calamites convinces me that they have distinct characters, and affords an additional link of connexion with Equisetaceæ. The leaves of *Asterophyllites* proper are flat, expanded in the middle, and with a distict midrib. Those of *Calamites* are strictly linear, thick, and angled, and are besides marked with transverse lines or striæ. Similar transverse lines occur on the branchlets of some modern *Equiseta*, and are produced by lines of minute stomata. Well-preserved specimens of Calamite-leaves have precisely the same appearance, so that they may be compared to branchlets of *Equiseta* deprived of their sheath. Flattened leaves of *Calamites*, it is true, sometimes present the appearance of a midrib; but this arises either from the prominence of the upper angle, or the appearance of an internal axis through the substance of the leaf. Unless very badly preserved, they can always be distinguished from *Asterophyllites* or *Annularia*. The connexion supposed, by Ettingshausen and others, to obtain between *Calamites* and *Asterophyllites* has arisen either from accidental association, or from failure to distinguish leaves and stems of *Calamites* from the corresponding parts of *Asterophyllites**. The conjecture of Brongniart that some, at least, of the *Asterophyllites* may be leaves, not of

* The species *Asterophyllites comosus*, L. v. H., appears to consist of, or to include, leaves of *Calamites*; and there is reason to doubt whether the proper *Asterophyllites* should be separated from *Annularia*.