

the name *Calamopituis** for a group believed to be intermediate between *Calamodendron* and true *Calamites*. On still other grounds, *Bornia* and other genera or subgenera have been separated from *Calamites* proper. Latterly Schimper has endeavoured to combine the view of the Equisetaceous affinities and annual growth of the stems of *Calamites* with what, at first sight, seems the totally irreconcilable woody character of the stem of *Calamodendron* as described by Cotta, Dawes, and Binney.

In all my own publications on this subject, from the date of my first paper on *Calamites* published in the Journal of this Society†, I have held that *Calamites* proper are Equisetaceous plants, having the external characters of their stems preserved, and that in the last respect they differ from the internal casts which belong to *Calamodendron*. All my subsequent observations have served to confirm these conclusions, which I would now illustrate by the following considerations.

1. The true *Calamites* (e. g. *C. Suckovii*, *C. cannaeformis*, *C. Cistii*, &c.), when well preserved, present, externally, somewhat flat smooth striated ribs, with distinct nodes, and having, at the upper end of each rib, a rounded areole with a central dot or scar, marking the disarticulation of a leaf, branchlet, or root, or, in some cases, the extremity of one of those radial prolongations of the pith which have been described by Williamson. In one specimen in my possession there is a double set of marks—smaller ones on the node, apparently belonging to the appendages, and larger marks below the node, which may represent the radial prolongations of the pith (Pl. X. fig. 22). The cortical investment is very thin and dense, and presents externally the characters of an epidermis, not showing, as in the case of *Sternbergia* or *Calamodendron*, a coating of woody fibres externally, and therefore cannot be regarded as a mere medullary sheath or, as Schimper supposes, the membrane lining the hollow interior of the stem. I may remark here, that erect *Calamites* are sometimes surrounded by a calcareous or ferruginous concretionary coating which must not be confounded with the true surface of the stem.

2. The ordinary *Calamites* are seen to stand erect, rooted *in situ*, and attached together at the bases, or arising from rhizomata. The stems can be seen to bud from each other; and the roots can be traced proceeding from their bases and lower nodes. Figures of erect specimens were given in my paper on Erect *Calamites*, and also in that on the South Joggins‡. Abundant specimens may be obtained in the magnificent petrified *Calamite* brakes at the last-mentioned locality, and, I venture to say, cannot be studied by any geologist without producing the conviction that the erect cylindrical casts imbedded in groups in the sandstone must represent the true external form of the plant. I have also shown, in the paper above cited, that these erect stems are crushed by lateral pressure, and broken down

* Preoccupied by Unger for certain Devonian plants.

† On the Occurrence of Upright *Calamites* near Pictou, Nova Scotia, Quart. Journ. Geol. Soc. vol. vii. p. 194.

‡ Quart. Journ. Geol. Soc. vol. vii. p. 194, and vol. x. p. 1.