

Ordinary Meeting, October 19th, 1869.

J. P. JOULE, LL.D., F.R.S., &c. President, in the Chair.

“On a new form of Calamitean Strobilus,” by Professor  
W. C. WILLIAMSON, F.R.S.

The author referred to the labours of Mr. Binney and Mr. Carruthers in elucidating the structure of the ordinary type of Calamitean Strobili as affording a standard of comparison, and then proceeded to describe his specimen, which was from the cabinet of Mr. J. Butterworth of High Crompton. It had been a strobilus approaching nearer to *Aphylostachys* than to *Volkmannia*, only the three lowermost verticils or joints were preserved. Externally the central axis had been fluted longitudinally like the stems of Calamites. It consisted of a medullary cavity surrounded by a cylinder consisting largely of cellular and prosenchymatous tissues, but also containing, in the prominent external ridges, bundles of *reticulated* vessels. Where these vessels crossed the nodes they described a series of arches of which the concavities were directed towards the medulla, as the author had, in a previous memoir, pointed out to be the case in *Calamopituis*. Immediately above and below each node the ten external ridges of the axis gradually became more prominent until, at the node, they coalesced, converting the external grooves of the axis into short canals, of which the transverse section was pyriform, and forming a continuous foliar disk, chiefly of cellular tissue, in which were an outer series of twenty smaller pyriform apertures diverging obliquely in pairs from each of the ten larger ones. At the outer angle of each smaller aperture a sporangiophore ascended almost vertically into the cavity of the strobilus, being nearly parallel with the central axis. This sporangiophore supported three or four sporangia grouped around it in a horizontal verticil, the

PROCEEDINGS—LIT. & PHIL. SOCIETY.—VOL. IX.—No. 2.—SESSION 1869-70.

horizontal section of the entire strobilus consisting of a circle of these smaller sporangial verticils which were so densely packed together as to disturb and mask the regularity of their arrangement. Having given off these sporangiophores with the reproductive organs which they supported, the verticillate foliar disk dipped suddenly downwards and, describing a circular curve, as suddenly outwards and upwards, where it terminated in a verticil of numerous ovato-lanceolate bracts, which enclosed the exterior of the segment to which they belonged and protected the contained sporangia. The author pointed out where the strobilus differed from those described by Binney and Carruthers. In the former each node gave off a horizontal verticil of coalesced bracts, from the centre of which a series of sporangiophores ascended as vertical divergent branches, whilst in the latter there was an alternating arrangement, one node giving off the disk of coalesced bracts, and the next a verticil of sporangiophores springing at right angles *from the central axis*, and having their respective sporangiophores clustered round them in perpendicular verticils. In the author's example the sporangiophores were densely filled with spores, each consisting of an outer cell-wall, an inner cell-membrane or primordial utricle, and cell contents which were often aggregated into a distinctly defined mass in the centre of the cell. There were no traces of elaters connected with the spores.

The author pointed out that in its general aspect and in the type of its structure the strobilus was unmistakably Calamitean—the peculiarity in the position of its sporangiophores being merely generic. Its Calamitean character was further established by the peculiar arched arrangement of the vascular bundles where they cross the nodes—an arrangement which the author has never seen except in Calamites. All the detailed features of the strobilus distinguish it from those described by Binney and Carruthers, and

especially the fact that, whilst in all the latter the vascular structures are scalariform, as in the stems to which they are supposed to belong, in this example the vessels are reticulated. But the only Calamitean example hitherto discovered containing such vessels is that described by the author under the name of *Calamopitus*, to which, or to some near ally of it, he believes the strobilus to have belonged. If this be a correct conclusion, the plant furnishes an instance derived from the carboniferous vegetation of a highly organised axis, exogenous in its growth and furnished with medullary rays, but which nevertheless sustained a cryptogamic strobilus. Such a combination, however, is but a primæval illustration of a combination still existing amongst the living *Marsileaceæ*, with which *Calamites* present some affinities. The specimen described was found by Mr. Butterworth in one of the lower beds of the Lancashire coal measures.

---



---

#### MICROSCOPICAL AND NATURAL HISTORY SECTION.

October 11th, 1869.

JOHN WATSON, Esq., President of the Section, in the Chair.

The President delivered an address, from which the following are extracts:—

Some of our botanical members occasionally meet together for excursions in pursuit of their favourite study, and it might be of advantage if the microscopical members would do the same. There are many districts which would yield reward in working, and I may mention that I have been very fortunate during the past summer in obtaining a large number of infusoria, many of them scarce and some new to me: these were found in the succession of ponds lying in the fields between Castle Mill and Mobberly, nearly every pool