

larly or spirally arranged. The transverse swellings of the stem show no difference of structure, except that the tubes or cells may be a little more tortuous, and a transverse film of coaly matter extends from the outer coaly envelope inwardly. This may perhaps be caused by some accident of preservation. The outer coaly layer shows tubes similar to those of the stem.* The horizontal or oblique flexures of the large tubes seem to be mainly in the vicinity of the radial openings, and it is in entering these that they have been seen to branch."

The conclusions arrived at by Prof. Penhallow are as follows :

"1. The plant was not truly exogenous, and the appearance of rings is independent of the causes which determine the layers of growth in exogenous plants.

"2. The plant was possessed of no true bark. Whatever cortical layer was present was in all probability a modification of the general structure.†

"3. An intimate relation exists between the large tubular cells and the myceloid filaments, the latter being a system of small branches from the former ; the branching being determined chiefly in certain special openings which simulate medullary rays.

"4. The specimens examined exhibit no evidence of special decay, and the structure throughout is of a normal character.

"5. The primary structure consists of large tubular cells without apparent terminations, and devoid of structural markings, with which is associated a secondary structure of myceloid filaments arising from the former.

"6. The structure of *Nematophyton* as a whole is unique ; at least there is no plant of modern type with which it is comparable. Nevertheless, the loose character of the entire structure ; the interminable cells ; their interlacing ; and, finally, their branching into a secondary series of smaller filaments, point with considerable force to the true relationship of the stem as being with Algæ or other Thallophytes rather than with Gymnosperms. A more recent examination

* It is possible that these tubes may be merely part of the stem attached to the bark, which seems to me to indicate the same dense cellular structure seen in the bark of *Lepidodendra*, etc.

† On these points I would reserve the considerations : 1. That there must have been some relation between the mode of growth of these great stems and their concentric rings ; and, 2. That the evidence of a bark is as strong as in the case of any Palæozoic tree in which the bark is, as usual, carbonised.