

medullary rays, [or that water-soaked wood cannot be cracked in this way.]

Perhaps the grossest of all Mr. Carruthers' histological errors is his affirming that some of my specimens of Prototaxites show merely cellular structures, or are, as he says, "made up of spherical cells." Now, I affirm that in all my specimens the distinct fibrous structure of Prototaxites occurs, but that in parts of the larger trunk, as is usual with fossil woods, it has been replaced by concretionary structure, or by that pseudo cellular structure which proceeds from the formation of granular crystals of silica in the midst of the tissues. Incredible though it may appear, I know it to be a fact, as all the specimens I gave to Mr. Carruthers had been sliced and studied by myself, that it is this crystalline structure which the botanist of the British Museum mistakes for vegetable cells.* I think it right to state here that I not only gave Mr. C. specimens in these different states of preservation, but that I explained to him their nature and origin.

It is unnecessary to follow further the histological part of the question, as my object is not so much to expose the errors of Mr. Carruthers as to illustrate the true structure of Prototaxites.

3. *Affinities*.—In discussing these I must repeat that we must bear in mind with what we have to deal. It is not a modern plant, but a contemporary of that "prototype of gymnosperms" *Aporoxylon*, and similar plants of the Devonian. Further, the comparison should be not with exogens in general, or conifers in general, but with Taxineæ, and especially with the more ancient types of these. Still further, it must be made with such wood partly altered by water-soakage and decay and fossilized. These necessary preliminaries to the question appear to have been altogether overlooked by Mr. Carruthers.

My original determination of the probable affinities of Prototaxites, as a very elementary type of taxine tree, was based on the habit of growth of the plant—its fibrous structure, its spirally-lined fibres, its medullary rays, its rings of growth, and its coaly bark, along with the durable character of its wood, and its mode of occurrence; and I made reference for comparison to other Devonian woods and to fossil taxine-trees.

* In fossil-woods, the carbonaceous matter, being reduced to a pulpy mass, sometimes partly becomes moulded on the surfaces of hexagonal or granular crystals, in such a manner as to deceive very readily an observer not aware of this circumstance.