http://www.geology.19thcenturyscience.org/books/1859-Lyell-Elements/README.htm

Owing to the outward slope of the face of the cliff, the section (fig. 493) was not exactly perpendicular to the axis of the tree; and hence, probably, the apparent sudden termination at the base without a stump and roots.

In this example the layers of matter in the inside of the tree are more numerous than those without; but it is more common in the coal-measures of all countries to find a cylinder of pure sandstone,—the cast of the interior of a tree, intersecting a great many alternating beds of shale and sandstone, which originally enveloped the trunk as it stood erect in the water. Such a want of correspondence in the materials outside and inside, is just what we might expect if we reflect on the difference of time at which the deposition of sediment will take place in the two cases; the imbedding of the tree having gone on for many years before its decay had made much progress.

In many places distinct proof is seen that the enveloping strata took years to accumulate, for some of the sandstones surrounding erect sigillarian trunks support at different levels roots and stems of *Calamites*; the *Calamites* having begun to grow after the older *Sigillariæ* had been partially buried.

The general absence of structure in the interior of the large fossil trees of the Coal implies the very durable nature of their bark, as compared with their woody portion. The same difference of durability of bark and wood exists in modern trees, and was first pointed out to me by Mr. Dawson, in the forests of Nova Scotia, where the Canoe Birch (*Betula papyracea*) has such tough bark that it may sometimes be seen in the swamps looking externally sound and fresh, although consisting simply of a hollow cylinder with all the wood decayed and gone. In such cases the submerged portion is sometimes found filled with mud.

One of the erect fossil trees of the South Joggins has been shown by Mr. Dawson to have Araucarian structure, so that some *Coniferæ* of the Coal period grew in the same swamps as *Sigillariæ*, just as now the deciduous Cypress (*Taxodium distichum*) abounds in the marshes of Louisiana, even to the edge of the sea.

When the carboniferous forests sank below high-water mark a species of *Spirorbis* or *Serpula* (fig. 498) attached itself to the outside of the stumps and stems of the erect trees, adhering occasionally even to the interior of the bark,—another proof that the process of envelopment was very gradual. These hollow upright trees, covered with innumerable marine annelids, reminded me of a "cane-brake," as it is commonly called, consisting of tall reeds of *Arundinaria macrosperma*, which I saw, in 1846, at the Balize, or extremity of the delta of the Mississippi. Although these reeds are freshwater plants, they were covered with barnacles, having been killed by an incursion of salt water over an extent of many acres, where the sea had for a season usurped a space previously gained from it by the river. Yet the dead reeds, in spite of this change, remained standing in the soft mud, showing how easily the *Sigillariæ*, hollow as they were