

attribute in great part to aquatic plants, allied to modern *Salvinia*, etc., are chiefly found.<sup>1</sup>

For these and other reasons, some of which are more fully stated in the papers referred to, while I admit that the areas of coal accumulation were frequently submerged, I must maintain that the true coal is a subaërial accumulation by vegetable growth on soils wet and swampy, it is true, but not submerged. I would add the further consideration, already urged elsewhere, that in the case of the fossil forests associated with the coal, the conditions of submergence and silting-up which have preserved the trees as fossils, must have been precisely those which were fatal to their existence as living plants, a fact sufficiently evident to us in the case of modern submarine forests, but often overlooked by the framers of theories of the accumulation of coal.

It seems strange that the occasional inequalities of the floors of the coal beds, the sand or gravel ridges which traverse them, the channels cut through the coal, the occurrence of patches of sand, and the insertion of wedges of such material splitting the beds, have been regarded by some able geologists as evidences of the aqueous origin of coal. - In truth, these appearances are of constant occurrence in modern swamps and marshes, more especially near their margins, or where they are exposed to the effects of ocean storms or river inundations. The lamination of the coal has also been adduced as a proof of aqueous deposition; but the microscope shows, as I have elsewhere pointed out, that this is entirely different from aqueous lamination, and depends on the superposition of successive generations of more or less decayed trunks of trees and beds of leaves. The lamination in the truly aqueous canals and carbonaceous shales is of a very different character.

It is scarcely necessary to remark that in the above summary

<sup>1</sup> "Geological History of Plants," *Bulletin Chicago Academy of Sciences*, 1886.