when they existed as soils, rain water, and not sea water, percolated them.

(5) The coal and the fossil trees present many evidences of subaërial conditions. Most of the erect and prostrate trees had become hollow shells of bark before they were finally imbedded, and their wood had broken into cubical pieces of mineral charcoal. Land snails and galley worms (*Xylobius*) crept into them, and they became dens or traps for reptiles. Large quantities of mineral charcoal occur on the surfaces of all the larger beds of coal. None of these appearances could have been produced by subaqueous action.

(6) Though the roots of *Sigillaria* bear some resemblance to the rhizomes of certain aquatic plants, yet structurally they have much resemblance to the roots of Cycads, which the stems also resemble. Further, the *Sigillariæ* grew on the same soils which supported conifers, *Lepidodendra*, *Cordaites*, and ferns, plants which could not have grown in water. Again, with the exception, perhaps, of some *Pinnulariæ* and *Asterophyllites*, and Rhizocarpean spores, there is a remarkable absence from the coal measures of any form of properly aquatic vegetation.

(7) The occasional occurrence of marine or brackish-water animals in the roofs of coal beds, or even in the coal itself, affords no evidence of subaqueous accumulation, since the same thing occurs in the case of modern submarine forests. Such facts merely imply that portions of the areas of coal accumulation were liable to inundation of a character so temporary as not finally to close the process, as happened when at last a roof shale was deposited by water over the coal. Cannel coals and bituminous shales holding mussel-like shells, fish scales, etc., imply the existence sometimes for long periods of ponds, lakes or lagoons in the coal swamps, but ordinary coal did not accumulate in these. It is in the cannels and similar subaqueous coals that the macrospores which I