

ferns, and other plants, which are found under circumstances which show that they grew with the *Sigillaria*.

In the coal measures of Nova Scotia, therefore, while marine conditions are absent, there are ample evidences of fresh-water or brackish-water conditions, and of land surfaces, suitable for the air-breathing animals of the period. Nor do I believe that the coal measures of Nova Scotia were exceptional in this respect. It is true that in Great Britain evidences of marine life do occur in the coal measures; but not, so far as I am aware, in circumstances which justify the inference that the coal is of marine origin. Alternations of marine and land remains, and even mixtures of these, are frequent in modern submarine forests. When we find, as at Fort Lawrence in Nova Scotia, a modern forest rooted in upland soil forty feet below high-water mark,<sup>1</sup> and covered with mud containing living *Tellinas* and *Myas*, we are not justified in inferring that this forest grew in the sea. We rather infer that subsidence has occurred. In modern salt marshes it is not unusual to find every little runnel or pool full of marine shell fish, while in the higher parts of the marsh land plants are growing; and in such places the deposit formed must contain a mixture of land plants and marine animals with salt grasses and herbage—the whole *in situ*.<sup>2</sup>

These considerations serve, I think, to explain all the apparently anomalous associations of coal plants with marine fossils; and I do not know any other arguments of apparent weight that can be adduced in favour of the marine or even

<sup>1</sup> *Journal of Geological Society*, vol. xi.

<sup>2</sup> In the marshes at the mouth of Scarborough River, in Maine, channels not more than a foot wide, and far from the sea, are full of *Mussels* and *Myæ*; and in little pools communicating with these channels there are often many young *Limuli*, which seem to prefer such places, and the cast-off shells and other remains of which may become imbedded in mud and mixed with land plants, just as in the shales of the coal measures.