

I have had reference principally to my own observations in the coal formation of Nova Scotia; but similar facts have been detailed by many other observers in other districts.¹

A curious point in connection with the origin of coal is the question how could vegetable matter be accumulated in such a pure condition? There is less difficulty in regard to this if we consider the coal as a swamp accumulation *in situ*. It is in this way that the purest vegetable accumulations take place at present, whereas in lakes and at the mouths of rivers vegetable matter is always mixed up with mud. Coal swamps, however, must have been liable to submergences or to temporary inundations, and it is no doubt to these that we have to attribute the partings of argillaceous matter often found in coal beds, as well as the occasional gulches cut into the coal and filled with sand and lenticular masses of earthy matter. To a similar cause we must also attribute the association of cannel with ordinary coal. The cannel is really a pulpy, macerate mass of vegetable matter accumulated in still water, surrounded and perhaps filled with growing aquatic herbage. Hence it is in such beds that we find the greatest accumulations of macrospores, derived, probably, in great part from aquatic plants. Buckland long ago compared the matter of cannel to the semifluid discharge of a bursting bog, and Alex. Agassiz has more recently shown that in times of flood the vegetable muck of the Everglades of Florida flows out in thick inky streams, and may form large beds of vegetable matter having the character of the materials of cannel. It is evident that in swamps of so great extent as those of the coal formation, there must have been shallow lakes and ponds, and wide sluggish streams, forming areas for the accumulation of vegetable *débris* and this readily accounts for the association of ordinary beds of coal with those of cannel, and with bituminous shales or

¹ Especially Brongniart, Goeppert, Hawkshaw, Lyell, Logan, De la Boche, Beaumont, Binney, Rogers, Lesquereux, Williamson, Grand' Eury.