

becomes at once apparent when we learn that the fire-clay was the soil on which the plants grew that went to form the coal. Where the clay was laid down under suitable circumstances, vegetation sprang up upon it. This appears to have taken place in wide shallow lagoon-like expansions of the sea, bordering land clothed with dense vegetation, and to have been accompanied by slow, intermittent, but prolonged subsidence of the sea-bottom. Hence, during pauses of the downward movement, when the water shoaled, an abundant growth of water-loving or marshy plants sprang up on the muddy bottom, somewhat like the mangrove-swamps of the present day, and continued to flourish until the muddy soil was exhausted,¹⁰ or until subsidence recommenced and the matted jungles, carried under the water, were buried under fresh inroads of sand or mud. Each coal-field thus contains a succession of buried forests with a constant repetition of the same kind of intervening strata (Fig. 217).

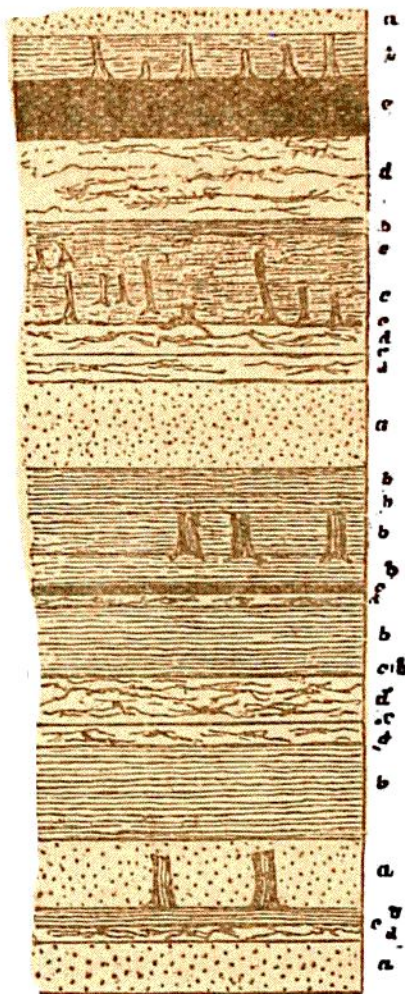


Fig. 217.—Succession of buried coal-growths and erect tree-stumps, Sydney Coal-Field, Cape Breton (R. Brown).¹¹

a, sandstones; b, shales; c, coal-seams; d, beds containing roots and stumps *in situ*.

¹⁰ Sterry Hunt has called attention to the fact that the underclays of the Coal-measures have generally been deprived of their alkalies by the vegetable growth which they supported. In the little coal-basins of France evidence has been obtained that much of the coal was formed out of vegetation that had been swept down and buried by rapid currents. See the Memoir of M. Fayol cited on p. 837.

¹¹ See R. Brown, Quart. Journ. Geol. Soc. vi. p. 115; and De la Beche, "Geol. Observer," p. 505.