The terrestrial and marsh plants that accompany coal, and of which it was probably formed, might flourish between these successive inundations, their growth being sufficiently rapid to form a thick bed of vegetable matter in a short period; for, as they had not the ligneous structure of wood, their decomposition by vegetable fermentation might speedily be effected. Should it be objected, that some of the coal beds are from nine to thirty feet in thickness, and that a mass of vegetable matter, sufficient to form such beds, could not be collected in one season, it is sufficient to reply, that we know not the duration of the periods during which vegetation might proceed without interruption; and it deserves particular notice, in relation to this subject, that all thick beds of coal are divided into several minor strata, and have frequently thin strata of shale, clay, or sandstone between them, but they are called by the miners one bed, as the coal can be all got at the same level. The Staffordshire coal stratum, which is thirty feet thick, is divided into thirteen minor strata by seams of clay, &c.; and the thirteen feet bed of coal at Ashby Wolds is composed of several seams of different qualities.

Very thin seams of coal sometimes alternate with the shale lying between two large beds of coal. I have on the table before me, a mass from the Dudley coal-field, in which part of two beds of coal are separated by a stratum of indurated clay or shale, about two inches in thickness; this stratum of shale contains more than twenty seams of coal, none of which exceed the thickness of a wafer, but they are distinctly separated from each other by seams of shale. These thin seams of coal and shale, were probably formed by alternate depositions of leaves or minute aquatic plants, and of earthy particles forming layers of clay or sand. These are circumstances which appear to me to prove, that the formation of the coal strata was effected more rapidly than those geologists have hitherto been willing to admit, who have only examined coal mines, seated in an easy chair in their studies. I will first advert to the state in which fossil vegetables are found in coal mines, and shall give a section of a coal mine, which I examined in 1811, belonging to the late Marquis of Hastings. It is remarkable for the frequent repetition of the same series of strata, of precisely the same quality and thickness; proving a periodical recurrence of the conditions under which they were formed.

Vertical stems not unfrequently occur in coal-fields; but, from the mode of working or sinking for coal, it is seldom that they can be seen in that position. Where a stone quarry is open to-day in coal strata, and uncovers a considerable face of rock, there we may sometimes meet with fossil plants in their original position. In 1819, I had an opportunity of examining Burntwood quarry, at Althouse, near Wakefield, in Yorkshire, at which time there were numerous vertical stems in strata of sandstone. One stem which I measured in the quarry was nine feet in length, and ten inches in diameter;