

1. That those beds of the Upper Oolite, called the Portland, which are full of marine shells, were overspread with fluviatile mud, which became dry land, and covered with a forest, throughout a portion of space now occupied by the south of England, the climate being such as to admit of the growth of the *Zamia* and *Cycas*. 2. This land at length sank down and was submerged with its forest beneath a body of fresh water from which sediment was thrown down enveloping fluviatile shells. 3. The regular and uniform preservation of this thin bed of black earth over a distance of many miles, shows that the change from dry land to the state of a fresh-water lake, or estuary, was not accompanied by any violent denudation or rush of water, since the loose black earth, together with the trees which lay prostrate on its surface, must inevitably have been swept away had any such violent catastrophe taken place."*

The soil known as the *dirt-bed* is nearly horizontal in the Isle of Portland; but we discover it again not far from there in the sea-cliffs

of the Isle of Purbeck, having an inclination of 45° , where the trunks continue perfectly parallel among themselves, affording a fine example of a change in the position of beds originally horizontal. Fig. 124 represents this species of geological *humus*. "Each *dirt-bed*," says Sir Charles Lyell, "may, no doubt, be the memorial of many thousand years or centuries, because we find that two or three feet of vegetable soil is the only monument which many a tropical forest has left of its existence ever since the ground on which it now stands was first covered with its shade."†

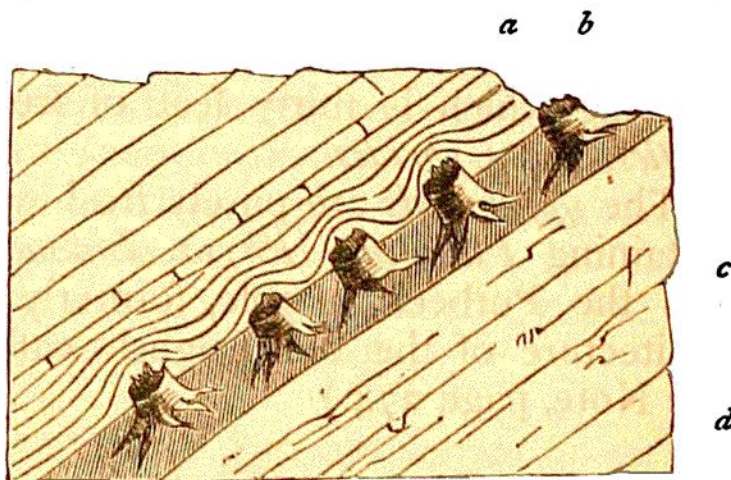


Fig. 124.—Geological humus. *a*, Fresh-water calcareous slate (Purbeck); *b*, Dirt-bed, with roots and stems of trees; *c*, Fresh-water beds; *d*, Portland Stone.

This bed of vegetable soil is, then, near the summit of that long and complicated series of beds which constitute the Jurassic period; these ruins, still vegetable, remind us forcibly of the coal-beds, for they are nothing else than a less advanced state of that kind of vegetable fossilisation which was perfected on such an immense scale, and during an infinite length of time in the coal period.

* "Elements of Geology," p. 389.

† Ibid, p. 391.