and plants which covered the surface of the earth would finally become buried under water. After this submergence new forests sprung up in the same place. Owing to another submergence, the second forests were depressed in their turn, and again covered by water. It is probably by a series of repetitions of this double phenomenon—this submergence of whole regions of forest, and the development upon the same site of new growths of vegetation—that the enormous accumulations of semi-decomposed plants, which constitute the Coal-measures, have been formed in a long series of ages.

But, has coal been produced from the larger plants only—for example, from the great forest-trees of the period, such as the Lepidodendra, Sigillariæ, Calamites, and Sphenophylla? That is scarcely probable, for many coal-deposits contain no vestiges of the great trees of the period, but only of Ferns and other herbaceous plants of small size. It is, therefore, presumable that the larger vegetation has been almost unconnected with the formation of coal, or, at least, that it has played a minor part in its production. In all probability there existed in the coal-period, as at the present time, two distinct kinds of vegetation: one formed of lofty forest-trees, growing on the higher grounds; the other, herbaceous and aquatic plants, growing on marshy plains. It is the latter kind of vegetation, probably, which has mostly furnished the material for the coal; in the same way that marsh-plants have, during historic times and up to the present day, supplied our existing peat, which may be regarded as a sort of contemporaneous incipient coal.

To what modification has the vegetation of the ancient world been subjected to attain that carbonised state, which constitutes coal? The submerged plants would, at first, be a light, spongy mass, in all respects resembling the peat-moss of our moors and marshes. While under water, and afterwards, when covered with sediment, these vegetable masses underwent a partial decomposition—a moist, putrefractive fermentation, accompanied by the production of much carburetted hydrogen and carbonic acid gas. In this way, the hydrogen escaping in the form of carburetted hydrogen, and the oxygen in the form of carbonic acid gas, the carbon became more concentrated, and coal was ultimately formed. This emission of carburetted hydrogen gas would, probably, continue after the peat-beds were buried beneath the strata which were deposited and accumulated upon them. The mere weight and pressure of the superincumbent mass, continued at an increasing ratio during a long series of ages, have given to the coal its density and compact state.

The heat emanating from the interior of the globe would, also,