The presence of this large percentage of carbonic acid and moisture would have given the atmosphere a correspondingly greater power of absorbing non-luminous heat, or that radiated by the warmed earth, and it therefore accounts for the uniformity in the earth's climate.

With conditions in the climate and atmosphere so favorable, the plants would have been rapid in growth, in covering emerged lands with jungles and forests, and in supplying vegetable debris for the thickening peat-beds. Although the era was one of more clouds than sunshine, growth must have been, if possible, more exuberant than it is now in tropical America.

The conditions were also favorable for decay. Old stumps of Lepidodendrids and Sigillarids, poor in wood, decayed within as they stood in the swamps, while the debris of the growing vegetation, or, in some cases, the detritus borne by the waters, accumulated around them; so that their hollow interiors received sands, or leaves, or bones, or became the haunts of reptiles, as was their chance.

FORMATION OF COAL FROM THE BEDS OF VEGETABLE DEBRIS.

The formation of coal out of the beds of vegetable debris probably only made a beginning while these beds lay as open beds of peat. The process is carried forward imperfectly in the modern peat-bed, and the best result is a poor coal, as it contains 25 per cent or more of oxygen. The deposits of clay or sand over the peat accumulations of the Carbonic era prevented the atmospheric oxygen from participating in the change, and to this is due the better product. The making of coal from wood has been explained on page 124, under Chemical Geology. The resulting mineral coal consists (1) chiefly of *carbon;* but (2) *anthracite* contains usually 2 to 5 per cent of oxygen and hydrogen, and the *bituminous* coals often 12 per cent in weight of oxygen and 4 to 6 of hydrogen; while *brown coal*, the bituminous coal of later formations (which ordinarily gives a brownish-black powder), contains 20 per cent or more of oxygen with 5 or 6 of hydrogen.

Mineral coal, therefore, is not carbon, but a compound, or a mixture of two or more compounds, of carbon, hydrogen and oxygen, associated probably with some free carbon in anthracite, and possibly in some or all bituminous coal. In this view, coals are mainly *oxidized hydrocarbons*, or mixtures of them. They are feebly acted on by ether or benzine, if at all, and hence contain little or no mineral oil, or only a trace of any soluble hydrocarbon; but, at a high temperature, hydrocarbons (compounds of hydrogen and carbon) are given out, and often very abundantly, in the form of either mineral oil, tar, or gas.

The process of the conversion of woody material into coal is briefly described on the page referred to. The vegetable material from which coal is made may be (*a*) woody fiber; (*b*) cellular tissue; (*c*) bark; (*d*) spores of Lycopods (Lepidodendrids, etc.); (*e*) resins and associated substances. The following is the composition of (1) dried wood in the mass; (2) cork (the