

for but a small part of the phenomena, which require to be explained by physical changes affecting the earth as a whole, or at least the northern hemisphere. Many theoretical views have been suggested on this subject, which will be found discussed elsewhere, and perhaps the most practical way to deal with them here will be to refer to the actual conditions known to have prevailed in connection with the introduction and distribution of the principal floras which have succeeded each other in geological history.

If we can assume that all the carbon now sealed up in limestones and in coal was originally floating in the atmosphere as carbon dioxide, then we would have a cause which might seriously have affected the earlier land floras—that, for instance, which may have existed in the Eozoic age, and those well known to us in the Palæozoic. Such an excess of carbonic acid would have required some difference of constitution in the plants themselves; it would have afforded them a superabundance of wood-forming nutriment, and it would have acted as an obstacle to the radiation of heat from the earth, almost equal to the glass roof of a greenhouse, thus constituting a great corrective of changes of temperature. Under such circumstances we might expect a peculiar and exuberant vegetation in the earlier geological ages, though this would not apply to the later in any appreciable degree. In addition to this we know that the geographical arrangements of our continents were suited to the production of a great uniformity of climate. Taking the American continent as the simpler, we know that in this period there existed in the interior plateau between the rudimentary eastern and western mountains a great inland sea, so sheltered from the north that its waters contained hundreds of species of corals, growing with a luxuriance unsurpassed in the modern tropics. On the shores and islands of such a sea we do not wonder that there should have been tree ferns and gigantic lycopods. In the succeeding Carboniferous,