

be declared to depend on a certain order of precedence in the introduction of different classes into the earth, and if it be maintained that the standard of organization was raised successively, we must then ascribe the numerical preponderance, in the earlier ages, of plants of simpler structure, *not to the heat*, or other climatal conditions, but to those different laws which regulate organic life in newly created worlds. If, according to the laws of progressive development, cryptogamic plants always flourish for ages before the dicotyledonous order can be established, then is the small proportion of the latter fully explained ; for in this case, whatever may have been the mildness or severity of the climate, they could not make their appearance.

Before we can infer an elevated temperature in high latitudes, from the presence of arborescent Ferns, Lycopodiaceæ, and plants of other allied families, we must be permitted to assume, that at all times, past, present, and future, a heated and moist atmosphere pervading the northern hemisphere has a tendency to produce in the vegetation a predominance of analogous types of form.

In the ancient strata of the carboniferous era, about 500 species of plants have been found.\* Among these, scarcely a trace has yet been discovered of the simplest forms of flowerless vegetation, such as Fungi, Lichens, Hepaticæ, or Mosses, and very few Algæ or seaweeds. On the other hand, there appears in their room a remarkable predominance of ferns, several of them arborescent, and plants allied to lycopodiums, of gigantic size, many of which, called Lepidodendra, formed large and tall trees. Other plants, of the family of Equisetaceæ, also abounded, and were of large dimensions, so that, on the whole, the cryptogamic class at least, exhibits in this era very highly organized species. That the simplest forms of the same class were then very rare ought not to be inferred on mere negative evidence. There existed at the same time many species of coniferous trees, allied to the Norfolk Island Pine, or Araucaria tribe ; and with these flourished other families of arborescent plants now extinct, such as Sigillaria, exhibiting in their structure some points of analogy with the Cycadeæ, but which, like the contemporary Nœggerathia and Asterophyllite, departed widely from all known living types. Palms were extremely rare, if not wholly wanting, as now in New Zealand, where the families of ferns and lycopodiums are so largely developed. The absence of palms may indicate a climate in which there was no great intensity of summer heat, while other characteristics of the carboniferous flora—such as the variety of ferns and Lycopodiaceæ—have been supposed to imply a maritime climate carried to an extreme. Yet if we assume that certain physical conditions, consisting chiefly of such a distribution of sea and land as was before described (p. 116.), caused an equable climate throughout the year, and great humidity in the atmosphere in various latitudes, and if this climate exerted a dominant influence on the state of the vegetable kingdom, we must not, at the same time, ascribe the scarcity or apparent

\* Ad. Brongniart, Genres de Végétaux Fossiles. 1849.