

in Nova Scotia, is an ice-formed ridge separating the area of accumulation of the great thirty-six feet seam from an outer area in which aqueous conditions prevailed, and little coal was formed. In this case, an ice-laden sea, carrying boulders on its floes and fields of ice, must have been a few miles distant from forests of *Lepidodendra*, *Cordaites*, and *Sigillariæ*, and the climate must have been anything but warm, at least at certain seasons. Nor have we a right to infer that the growth of the coal-plants was rapid. Stems, with woody axes and a thick bark, containing much fibrous and thick-walled cellular tissue, are not to be compared with modern succulent plants, especially when we consider the sparse and rigid foliage of many of them. Our conclusion should, therefore, be that geographical conditions and the abundance of carbon dioxide in the atmosphere favoured a moist climate and uniform temperature, and that the flora was suited to these conditions.

As to the early Mesozoic flora, I have already suggested that it must have been an invader from the south, for which the intervening Permian age had made way by destroying the Palæozoic flora. This was probably effected by great earth-movements changing geographical conditions. But in the Mesozoic the old conditions to some extent returned, and the Carboniferous plants being extinct, their places were taken by pines, lycopods, and ferns, whose previous home had been in the insular regions of the tropics, and which, as climatal conditions improved, pushed their way to the Arctic circle. But, being derivatives of warm regions, their vitality and capacity for variation were not great, and they only locally and in favourable conditions became great coal producers. The new flora of the Later Cretaceous and the Tertiary, as previously stated, originated in the Arctic, and marched southward.

These newer Cretaceous plants presented from the first the generic aspects of modern vegetation, and so enable us much better to gauge their climatal conditions. In general, they do