

and finally abandoned the Arctic regions, perhaps continuing to exist on the Pacific coast, and in sheltered places in the north, till the warm inland seas of the Upper Cretaceous had given place to the wide plains and landlocked brackish seas or fresh-water lakes of the Laramie period (Eocene). Thus the true Upper Cretaceous marks in the interior a cooler period intervening between the Middle Cretaceous and the Lower Eocene floras of Greenland.

This latter established itself in Greenland, and probably all around the Arctic circle, in the mild period of the earliest Eocene, and as the climate of the northern hemisphere became gradually reduced from that time till the end of the Pliocene, it marched on over both continents to the southward, chased behind by the modern arctic flora, and eventually by the frost and snow of the Glacial age. This history may admit of correction in details; but, so far as present knowledge extends, it is in the main not far from the truth.

Perhaps the first great question which it raises is that as to the causes of the alternations of warm and cold climates in the north, apparently demanded by the vicissitudes of the vegetable kingdom. Here we may set aside the idea that in former times plants were suited to endure greater cold than at present. It is true that some of the fossil Greenland plants are of unknown genera, and many are new species to us; but we are on the whole safe in affirming that they must have required conditions similar to those necessary to their modern representatives, except within such limits as we now find to hold in similar cases among existing plants. Still we know that at the present time many species found in the equable climate of England will not live in Canada, though species to all appearance similar in structure are natives of the latter. There is also some reason to suppose that species, when new, may have greater hardiness and adaptability than when in old age, and verging toward extinction. In any case, these facts can account