

and of the Orange-tree were touched with frost. This was said to have been an unusually severe winter. The mean temperature of Georgia is about 65° of Fahrenheit, and the Vancouver Island flora has most resemblance to that of the lower parts of the state. We have thus an indication of the remarkable mildness which characterized the climate of the later Cretaceous period in the more northern parts of America. I propose, however, to devote the third part of this paper to the presentation of a few points bearing on the value of fossil-plants as indicators of climate and time.

III.

While this paper was in preparation, important questions have arisen and have been discussed in special works¹ and scientific periodicals, respecting the value of fossil plants as tests of climate and geological age. As I do not propose to follow up the subject of Mesozoic and Tertiary Paleobotany in these 'Transactions' any farther, until I can have an opportunity to condense into one volume the papers already published, it may perhaps be well to devote a few pages to a consideration of what we have already learned on these subjects from the fossil flora of Canada. In doing this, I may refer to the series of papers published in the 'Transactions' of this Society in 1882 and following years, and relating to the fossil floras of most of the Mesozoic and Cenozoic formations of Canada.

It will be necessary to glance, in the first instance, by way of contrast, at the condition of the vegetable kingdom in the Palaeozoic period. In this part of the earth's history the problem is complicated by the peculiar character of many of the plants, as well as by the probability that the meteorological conditions were very dissimilar from those now prevailing. We may say in general terms that a flora of tree-ferns, giant lycopods and pines is akin to that of modern oceanic islands in warm climates. This is true, but the Devonian and Carboniferous plants did not grow exclusively on oceanic islands but on continental areas of considerable magnitude. They flourished also in all latitudes from the polar region to the equator, and though there are some generic differences in the plants of the period in the Southern Hemisphere, yet these do not seriously affect the general facies. There are characteristic *Lepidodendroids*, for example, in the Carboniferous of Brazil and South Africa and Australia, and though in the latter there are certain ferns allied to those of Mesozoic Europe, this is merely a local difference, not materially affecting climate, and corresponding with the fact that the European Mesozoic flora originated in the south. Nor does the doctrine of homotaxis seriously affect the question. Each geological period was sufficiently long to permit plants to migrate to every station they could occupy, and in every case the temporary and local climate must be indicated by the local flora, while the succession in any one place may be relied on as holding good over a very extensive area.

Looking at the Palaeozoic plants a little more in detail, coniferous and taxine trees grow now in very different latitudes and climates. There is therefore nothing so very remarkable in their occurrence. The great group of *Cordaites* may have been equally hardy, but it is noteworthy that its geographical distribution is more limited. In

¹ Especially Seward's "Fossil Plants as Tests of Climate," and Lesquereux's "Final Report on the Plants of the Dakota Group."