

and warm temperate conditions extending very far northward, and gradually passing in time into those of the colder Miocene and Pliocene. We can also to some extent correlate these climatal conditions with the geographical features of the several periods and with the contemporary animal remains.

I may add that the validity of such deductions does not altogether depend on the accuracy of the reference of particular species to existing genera. In many cases there can be no doubt of this, as in the species of *Liriodendron*, *Sassafras*, *Platanus*, *Sequoia* and *Salisburia*, and especially in the case of all those forms of which seed or fruit has been procured; but even where the naming may be inaccurate, or where the number of species has been unduly multiplied, the deductions as to climate may hold good, though not perhaps to the extent of enabling us to fix a definite thermometer mean temperature.

As to geological age, the primary requisite is that in some of the localities of fossil plants their position shall be fixed by stratigraphical evidence. This being done in a few cases, it is not difficult to assign to their approximate position intermediate or allied sub-floras. In Canada, though the collections of fossil plants have not been so large as would be desirable, we are fortunate in having the horizons of the leading floras accurately fixed by the officers of the Geological Survey, and the plants collected carefully referred to the beds to which they belong.

Thus, though the geographical conditions of the Mesozoic and Cenozoic are not of such a character as to enable us to refer sub-floras to their definite geological position throughout the whole Northern Hemisphere, in the manner in which this can be done for the plants of the Lower, Middle and Upper Carboniferous, a satisfactory approximation can be made, and I have no hesitation in affirming that it is possible to define with considerable accuracy the age of any collection of fossil plants from any part of our Cretaceous or Cenozoic districts.

Plants as evidence of geological age have the advantage of wide distribution over the surface of the land, and of long duration in any one place and slowness of migration when obliged or enabled to spread to new localities. They are also so closely connected with the great movements of subsidence and elevation which mark the lapse of geological time, that they are very certain indices of these, whether they affect plant life directly by elevation and submergence, or indirectly by changing climatal conditions.

As in the case of animal fossils, we have to allow for differences of station, for possible driftage and intermixture of species belonging to uplands and low levels, and varieties dependent on chances of deposition and preservation. We have also to consider that plants are more permanent and less changeable than the animal inhabitants of the land, so that they may not mark so small portions of time and so minute changes as may be indicated, for example, by mammalian remains.

On the whole there is very good reason to believe that the labours of Palaeobotanists have in the United States and Canada succeeded in securing for fossil plants an important place as guides in the determination of geological age. The knowledge we have acquired needs to be collected and arranged in such a manner as to make it more available than it can be when scattered, as at present, through a great number of reports and memoirs.