

There are also many types of inflorescences represented in these regions but the umbel is rare; and with regard to the floral structure, the actinomorphic and zygomorphic ones are both common and almost equally represented. With regard to the fruit, the fleshy type is rare and does not seem to mature every year as is evidenced in the genera *Vaccinium*, *Empetrum*, *Rubus*, and *Arctostaphylos*.

Certain biological types of plants are totally absent from the polar regions; there are no climbers and no true parasites of the *Cuscuta* or *Arceuthobium* type; yet *Pedicularis* is a root-parasite but one having a green foliage; saprophytes seem to be absent altogether.

Thus, with but a very few exceptions, viz.: *Pedicularis*, the arctic flora is composed of autophytes, herbs as well as shrubs, with the great majority of the herbs perennial, *Koenigia*, *Gentiana*, and *Pleurogyne* being the only annuals in arctic North America, not including a few accidentally introduced weeds.

Considering the general characteristics of the arctic plants, one cannot help but recall the picture of the alpine flora in general. Practically, the arctic flora is diversified to the same extent and represented by the same elements; the families, genera, and species are either identically the same or represented by analogous types, some of which may be endemic while others may have immigrated from other districts. This similarity in composition existing between the arctic and the alpine floras, as well as the analogy in the morphological structure of the plants, is, nevertheless, associated with such diversities of conditions as offer. For instance, the tundras of the arctic and the alpine summits of the south.

Concerning the origin of the arctic and of the alpine vegetation as it now exists, it may be mentioned that Nathorst is in favour of the supposition that the arctic vegetation, at least to some extent, originated in the lowlands of the polar regions, but that the greater portion was originally alpine. To draw the line between these two elements seems impossible, even if we may feel entitled to consider most of the circumpolar species to have originated in the north; and besides, there are quite a few species which are not circumpolar but, nevertheless, better represented in the north where they are more abundant; these may also be considered remnants of an arctic vegetation.

With the morphological structure so remarkably uniform in the arctic and alpine elements, we must consider them from another viewpoint, namely as "species." Developed as such, the arctic element appears, sometimes, as more or less isolated types like *Pleuropogon*, *Dupontia*, *Arctophila*, *Tofieldia*, *Oxyria*, *Koenigia*, *Monolepis*, *Merckia*, *Douglasia*, *Pachypleurum*, etc. Or we may trace an arctic origin in species of even large genera, whether circumpolar or simply arctic. For instance, *Saxifraga* contains types some of which are decidedly of arctic, others of alpine origin, as demonstrated in the preceding pages. *Ranunculus*, *Stellaria*, *Potentilla*, and several other genera, not speaking of the Gramineae and Cyperaceae, also illustrate such diversity of origin, arctic or alpine.

As a matter of fact, several of the genera characteristic of the polar regions are monotypic or nearly so; or in case of large genera, the arctic species are not infrequently somewhat isolated, i.e. from a systematic point of view, as if actually representing glacial types of the respective genera. I think especially of *Campanula uniflora*, *Polygonum viviparum*, *Eutrema Edwardsii*, *Bra. purpurascens*, *Parrya macrocar.*, *P. arctica*, *Ranunculus glacialis*, *R. Pallasii*, *Saxifraga flagellaris*, *Salix polaris*, *S. reticulata*, etc. And judging from their present geographical distribution I take these to be arctic types having originated in these regions and acquired a specific structure which makes them distinct from such of their congeners as are also distributed in the arctic regions but of which the original centre appears to have been located farther south, and principally in the higher mountains.