

even if the Scandinavian inland ice forced the plants to migrate to the south there might, nevertheless, have been time and conditions later on to give rise to some endemic element even though the geographic position of the country is rather northern. For, as pointed out by Nathorst, the Alps, in spite of their relatively young age, possess many alpine species about two-thirds of which are endemic to these mountains.

If now the question be asked where the arctic American species originated, we might suggest that the circumpolar species came from the arctic regions. But the objection naturally will be made that these, viz.: *P. lapponica*, *P. hirsuta*, and *P. sudetica* are at present better represented in Siberia where, moreover, they are associated with allied species. And the Siberian alliance of *Pedicularis* corresponds better with the circumpolar than does really the North American.

The genus is well represented in the Himalayas, since Hooker (Flora of Br. Ind. l.c.) has credited 35 species to these mountains; of these 2 occur also in Altai, 2 in Baikal, while *P. verticillata* and *P. Oederi* are, as we know, widely distributed farther north, east, and west; the remaining 29 species are endemic to the Himalayas.

Several of the arctic species reach a considerably high latitude, for instance those recorded from Spitzbergen; with regard to the Greenland species, *P. hirsuta* extends to Lat. $81^{\circ} 7'$ on the west coast, and to Lat. $74^{\circ} 40'$ on the east coast (Dusén); furthermore, *P. lapponica*, *P. lanata*, and *P. capitata* are reported from resp. Lat. $78^{\circ} 18'$, Lat. 79° , and Lat. $78^{\circ} 18'$ on the west coast; *P. flammea* reaches Lat. 74° on both coasts. And with regard to the altitude which the species attain in the mountains, *P. silvatica*, *P. lapponica*, and *P. Oederi* ascend to about 3,000 feet in Norway; in the Alps of Switzerland *P. verticillata* has been recorded from 9,000 feet (Heer, l.c.), and in the Himalayas most of the endemic species are alpine and several reach an elevation as high as 14-16,000 feet; *P. verticillata* and *P. Oederi* are in these mountains reported from resp. 13,000 and 15,000 feet.

With regard to distribution, *P. verticillata* exhibits the widest distribution especially southward, extending to the Alps of Switzerland, Altai, and the Himalayas; in the north it is absent from the arctic American archipelago, Greenland, Spitzbergen, and Scandinavia; thus it cannot be considered circumpolar. The present distribution of the species in the north, and at the same time its occurrence in the Alps, seems to indicate the probability of it having had a former, more extensive distribution northward during the glacial epoch. *P. flammea*, absent from Siberia but present in the arctic American archipelago, in Greenland, Scandinavia, Russia, and even in Iceland and the Alps, evidently originated in the north and presumably in the arctic regions of this continent and of western Europe. On the other hand, *P. Oederi*, totally absent from North America and Greenland but extending from Kamchatka through Siberia and Russia to Scandinavia and present in Altai and the Himalayas, may have had the centre located in the north of the Eurasian continent since it is not at present a southern species either in Europe or in Asia. *P. euphrasioides* is a genuine American type with several close allies in the Rocky mountains, and the Asiatic element of this species came undoubtedly from this continent where it is widely distributed south of the arctic region, from Labrador throughout the continent to Bering strait. While *P. arctica* is known only from arctic America, Siberia, and Kamchatka, *P. lanata* occurs also in Greenland, Spitzbergen, and Nova Zembla, but they both evidently originated from the polar regions of these two continents, America or Siberia; the same may be the case also of *P. capitata*. The very local *P. Kanci* replaces *P. arctica* in Greenland; *P. villosa* "nulli affinium consocianda," as stated by Ledebour (l.c.), is a Siberian type. With respect to *P. groenlandica* of the section *Rhyncolophae*, this is confined to the