

the Yenisei region of northern Siberia in about latitude 69°–70° N. and in glacial deposits in northern Jutland at a depth of about 83 metres below the ground. Williams<sup>62</sup> enumerates 68 species from the Arctic Region, of which 11 species (all sterile) belonged to the genus *Drepanocladus*, while *Bryum* was represented by 9 species, of which 5 were fruiting.

One of the most important lists is that of Dupret and Beaulac<sup>63</sup> for the region around Montreal containing 255 species, one of which, *Bryum camptoneurum* Card. and Thér., was hitherto undescribed. Another extensive list is that of Miss Brown<sup>64</sup> who records 346 species from Nova Scotia, of which one was a species new to science and two others had not been found previously in Canada.

### Liverworts.

In this group, likewise, Macoun's Catalogue<sup>65</sup> is the most important work to show the distribution, 163 species being enumerated. Although these plants find a more congenial environment in warmer climates, nevertheless, Hesselbo's list<sup>61</sup> mentions 11 genera and 15 species as occurring in the Arctic Region, 4 of which species are not included in Macoun's Catalogue. For Nova Scotia, Miss Brown's list<sup>64</sup> includes 119 species of which 4 are new to Canada and 2 are new to North America.

For Western Canada, the chief authority on the distribution of this group is Brinkman<sup>66</sup> who has listed 254 species for the territory bordering on the Pacific. Among these, 39 species occurred in Yukon, 186 species in British Columbia, and 105 species in Alberta.

### Lichens.

Unlike liverworts, the members of this group exhibit a great variety of habitats, some occurring on the surface of the ground, or on the bark of trees, or on bare rocks, or even on old bones. Being able to withstand a much more rigorous climate, they form an important element in the vegetation of the barren lands. Macoun in his Catalogue<sup>65</sup> enumerates 421 Canadian species, but since that date, with few exceptions, the study of this group has been largely neglected. And yet they are of decided economic importance particularly in the more northern parts, where they constitute the chief food of reindeer and caribou during the winter months.

As might be expected from the foregoing remarks, the lichens are well represented in the Arctic Region, the crustaceous species, according to Merrill,<sup>67</sup> being best developed, while the foliaceous and fruticose types are mostly dwarfed and infertile. With reference to the tundra formations, he states that "in many places through the Barren Ground region and the Alaskan peninsula the ground is covered to the depth of a foot or more with the debris of successive generations of lichens and mosses of which only the uppermost layer is living". Of the 80 species and 13 varieties listed by Merrill, he states that most of them may be expected to occur in alpine situations of Alberta and British Columbia, but 3 species, namely, *Cetraria chrysantha*, *Polyblastia scotinospora*, and *Verrucaria striatula*, appear to be exclusively Arctic.

Lynge's report on lichens collected during the Thule Expedition<sup>68</sup> included the names of 28 genera and 99 species. Of these, 55 species were not included in Macoun's Catalogue, a fact which goes to show that many species of lichens still remain to be discovered in this country. Lynge further added that it is hardly probable that the collection of 99 species covers as much as one-third of the whole lichen flora of the region.