

most bog species being more or less restricted to the acid heath bog habitat. In the case of the calciphilous plants, presence, as already noted, is low, but fidelity is high because of their restriction to calcareous habitats.

Greater youth even than the time dating from Wisconsin deglaciation seems to be a characteristic of the habitats of many rare plants. Wynne-Edwards has called attention to the necessity of accepting post-Wisconsin invasion in the case of certain typical Cordilleran species such as *Salix vestita*, *Dryas drummondii* and *Anemone multifida*, which are found on Anticosti Island and the Mingan Islands, places buried by the thick ice-sheet, as shown by grooves, striae and erratics, as well as submerged under the post-Wisconsin Champlain Sea. There is also strong geological evidence that at least some of the intermediate Great Lakes stations have undergone glaciation, as well as post-glacial submergence.

Attention might be drawn at this point to the occurrence on the serpentine tableland of Mount Albert, in the Gaspé Peninsula, Que., of a flora obviously specialized to the serpentine habitat. The writer (1950) lists 17 species of this area. The ability to survive on serpentine is apparently restricted to a rather few species (or ecotypes of the species) and many plants that are aggressive outside the serpentine area cease immediately at its boundary. Rune (1954) notes that the infertility of serpentine soils is due not only to their low nutritional content but also to their comparatively high content of nickel and chromium, a factor toxic for most plants.

The question of polyploidy (multiplication of the basic chromosome number) in relation to plant distribution merits some attention. A 'diploid' is a plant or animal whose body cells contain paired chromosomes, the total number of chromosomes being twice that found in the sex cells. A 'polyploid' is a plant or animal whose body cells contain three or more times the number of chromosomes characteristic of the sex cells. The theory has been advanced that severely cold climates may induce the formation of polyploids. There is evidence to show that, in general, polyploids are more hardy than diploids, and that they are more abundant in high northern regions.

The probability is that some of the rare species may consist of only one or a few polyploid 'ecotypes' unable to survive except under the peculiar conditions to which they are adapted. The hardships to which they were subjected while being forced southward by the Wisconsin ice-sheet may have substantially depleted the biotype stock, and subsequent inbreeding may in some cases have further sharply defined the species from ancestral types. According to Stebbins (1942), certain of these ecotypes may have been eliminated through combinations of recessive genes expressing themselves phenotypically as non-adaptive characteristics.

Löve and Löve (1949) have discussed *The Geobotanical Significance of Polyploidy*, giving in their summary 20 of the general features of polyploids, among which are an increase in polyploids with higher latitude or altitude, an increased adaptability of polyploids to climatic extremes of temperature and moisture, and a high frequency among glacial survivors in Scandinavia, Iceland and Spitsbergen.

According to Cain (1940), "With respect to the effects of glaciation, we may suppose a history somewhat as follows: In the general vicinity of the glacial boundary old diploid species, formerly well isolated, are brought together because of the vicissitudes of forced migrations. In such a region, especially after glacial recession has commenced, there are numerous new, variable and closely associated habitats in which populations of a variety of species can live in rather close proximity. The result of this intermingling of species may be the production of hybrids, followed sometimes by amphidiploidy. With continued glacial recession, the polyploids and backcrosses are in a position to expand their area tremendously. Some of the diploids also may extend far onto the glacial plain, but most of them will probably have only a limited expansion. The chances of such polyploids spreading into unglaciated territory to any considerable extent seem unlikely because penetration of closed communities is more difficult".