are characteristic plants of this dry belt. It should be remembered that Thornthwaite's map comprises broad generalizations because of the extensive area covered. He did not attempt to show local differences. Concerning local refinements of the Climatic Provinces as illustrated in the Gaspe Peninsula of Quebec, see Scoggan (1950, p. 17).

Hours of Daylight.—A third climatic factor should be mentioned, namely, length of daylight. Being chiefly 'long-day' plants, arctic and alpine species are able to complete their annual life cycle during the relatively short snow-free growing season because of the long period of daylight during the arctic summer or at high altitudes farther south. They flower rapidly in their natural habitat but flowering is inhibited if they are transplanted or grown from seed in lower latitudes or altitudes. On the other hand, many southern species are 'short-day' plants and will produce flowers only in the autumn when days become shorter. However, by an artificial shortening of the exposure to daylight, they may be made to bloom at the beginning of summer.

Plant Distribution

In addition to the climatic factors that obviously influence the distribution of plants, there are other factors such as soil composition, biotic factors (genetical constitution and competition with other plants), and historical factors (glaciation and post-glacial submergence) that greatly modify what should otherwise be rather regular plant distributional patterns. These factors are discussed concurrently, because the attempted explanation of some of the most interesting problems of plant distribution in Canada involves their mutual interplay.

Practically the whole of continental Canada was at one time or another covered by ice-sheets during the Pleistocene era, now believed by many geologists to have terminated not more than about 10,000 or 15,000 years ago. In addition, large bodies of fresh water, dammed up by the retreating ice-fronts, made plant immigration impossible for long periods of time following the glaciation. Glacial Lake Agassiz, for example, the forerunner of the present-day Lakes Winnipeg, Manitoba and Winnipegosis, at one time covered the entire Manitoba Lowlands, extending at its maximum to approximately 55° N and including the upper part of the present Nelson River system. It is estimated to have covered the present site of Winnipeg to a depth of 600 feet at the time of formation of its highest beach. The flat, smooth topography of the Manitoba Lowlands is the result of the deposition of silts and clays in Lake Agassiz, which, during its various phases of drainage, established the many beaches now traceable along the Manitoba Escarpment as gravel ridges or wave-cut terraces.

In Manitoba, then, the period available for recolonization of extensive parts of the land by plants may be of the order of only about 5,000 years. Concerning deglaciation of the region north of the Great Lakes, Terasmae (1960) notes that radiocarbon dating suggests that the North Bay outlet, by which the melted water was discharged to the east by way of the Mattawa and Ottawa river valleys, opened about 10,000 years ago. It appears definitely established that entire plant associations can migrate at a relatively rapid rate into new territory when not competing with other associations.

It is interesting to note along the shores of the eastern Great Lakes such typical coastal halophytes as sea-rocket (*Cakile edentula*), beach-pea (*Lathyrus japonicus*) and seaside-spurge (*Euphorbia polygonifolia*), evidence that the post-glacial Lake Champlain allowed waters of the Atlantic Ocean to reach this far inland before isostatic recovery of the land from its tremendous load of ice. Potter (1932) and LaRocque (1949) have used halophytic plants as one of their criteria in discussing the possibility of a post-Pleistocene marine connection between James Bay and the Champlain Sea. Schofield (1959) discusses the salt-marsh vegetation of Churchill, Man., and its phytogeographic implications.

Hultén (1958) has published 278 excellent maps showing the distribution of "amphi-Atlantic" species (those that occur chiefly off the eastern and western edges of the Atlantic Ocean but are elsewhere usually of rather limited range). Many of these species are