

columbo (*Swertia caroliniensis*), five milkweeds (*Asclepias exaltata*, *hirtella*, *purpurascens*, *sullivantii*, and *tuberosa*), two waterleaves (*Hydrophyllum appendiculatum* and *canadense*), wild potato-vine (*Ipomoea pandurata*), fog-fruit (*Lippia lanceolata*), three false foxgloves (*Aureolaria flava*, *pedicularia*, and *virginica*), blue-hearts (*Buchnera americana*), conobea (*Conobea multifida*), richweed (*Collinsonia canadensis*), corn-salad (*Valerianella chenopodiifolia*), climbing hempweed (*Mikania scandens*; the only climbing composite in Canada), wing-stem (*Actinomeris alternifolia*), leafcup (*Polymnia canadensis*), ironweeds (*Vernonia*) and four rosinweeds (*Silphium*).

Other herbs with their main area in this Region but ranging northward to near Ottawa or Montreal include two sedges (*Fimbristylis autumnalis* and *Scleria triglomerata*), skunk-cabbage (*Symplocarpus foetidus*), two aquatic water-meals (*Wolffia columbiana* and *W. punctata*); the simplest and smallest of all flowering plants), pokeweed (*Phytolacca americana*), a bush-clover (*Lespedeza capitata*) and an umbellifer (*Chaerophyllum procumbens*). The spring flowers listed for the Great Lakes-St. Lawrence Forest Floral Region (see p. 39) also occur here.

Prairie Grasslands and Parklands Floral Region

This Region begins a few miles east of Winnipeg and ends at the Rocky Mountain foothills of Alberta. Its northern boundary extends from the south end of Lake Winnipeg to the vicinity of Edmonton. Approximately the northern third is aspen parkland in which open stands of aspen (*Populus tremuloides*) and bur-oak (*Quercus macrocarpa*) mark the transition between the grasslands to the south and the boreal coniferous forest to the north. The Region comprises three general levels, rising from east to west. The first and lowest level includes most of the relatively moist Manitoba prairie except the extreme southwestern corner. It is marked off from the second prairie level to the west by a glacial moraine, the Missouri Coteau, west of Estevan in southeastern Saskatchewan. Because of the abundance of many relatively tall, conspicuously flowered plants such as prairie-lily (*Lilium philadelphicum*), beard-tongues (*Penstemon*), asters (*Aster*), goldenrods (*Solidago*) and sunflowers (*Helianthus*), this first prairie level has a more lush appearance than those to the west, whose more arid nature is reflected in the abundance of prickly pear (*Opuntia polyacantha*), purple cactus (*Mamillaria vivipara*), prairie sagewort (*Artemisia frigida*), and such short wiry xerophilous grasses as grama-grass (*Bouteloua gracilis*) and buffalo-grass (*Buchloe dactyloides*). The third prairie level begins near Parkbeg, Sask., about 30 miles west of Moose Jaw, and continues westward to the Rocky Mountain foothills.

Precipitation is the principal factor affecting plant growth in the prairies but its seasonal distribution and its range of fluctuation from year to year are often more important than the actual total inches of rain. The average annual precipitation in southwestern Manitoba, for example, is between 10 and 28 inches, but occasional years of high rainfall tend to mask the true conditions. The years of drought are the critical ones. Much of the Manitoba area, as well as the parklands of Saskatchewan and Alberta, fall within Thornthwaite's Sub-humid Microthermal Climatic Province (see p. 59), denoting suitable temperatures and adequate precipitation for plant growth. Most of the grasslands of Saskatchewan and Alberta, however, fall within his Semi-arid Microthermal Climatic Province, characterized by a deficiency of precipitation.

Several theories, including the effect of lightning, large herds of buffalo, or of fires made by the early Indians, have been advanced to account for the treelessness of the prairies, but climatic conditions are probably largely responsible. The characteristic absence of trees on exposed, well-drained upland sites reflects the adverse influence of low precipitation effectiveness, although the extremely tough nature of the thick prairie sod is undoubtedly also a major barrier to the establishment of tree seedlings. The well established and extensive root systems of the prairie species, which thoroughly occupy the soil in several more or less distinct strata from a level immediately below the surface, greatly reduce the chances for survival of tree seedlings, which must also withstand the extremely severe conditions of the first winter's exposure. These factors may largely explain the