The mountains and highlands of the Eastern Cordillera are much lower than those of the Western Cordillera and, furthermore, since they are located on the east side of the Continent in the westerlies zone, their effect on the climate is relatively slight. In southeastern Quebec and in the Ungava-Labrador region there is evidence of increased precipitation along the westward slopes and decreased precipitation and slightly warmer temperatures on the eastward lee slopes. Compared to that caused by the Pacific, the Atlantic Ocean has little effect on the climate of Canada. Occasionally there is an extensive circulation of moist cool air over eastern Canada from the Atlantic but these are abnormal situations. Of course, the coastal areas of the Atlantic Provinces do have modified temperatures and increasingly humid conditions when the winds blow inland from the ocean. Mention should also be made of the cold Labrador Current which maintains Arctic-like conditions along the Labrador coast and is responsible for the extensive areas of fog and low cloud over and off the Atlantic Provinces in spring and early summer.

Climatic Regions

Before beginning a detailed study of the provincial and territorial climates, it might be well to examine the basic climatic features and the various climatic regions of the country.

Mean temperature maps of Canada during the summer and winter seasons are quite dissimilar in appearance. Apart from the obvious difference of higher mean temperatures in summer, the January and July maps (Figs. 1 and 2) have different basic patterns. In winter the coastal areas are much warmer than the interior for the same latitudes producing isotherms with a concave pattern over the country. In summer when the continental land areas are warmer than the oceans the isotherms have a convex appearance. It should also be noted that the latitudinal thermal gradient, or difference in temperature from north to south, is considerably greater in winter than in summer. The coastal areas, of course, show the least change in mean temperature from January to July, 20° to 25°F. on the Pacific Coast and 40°F. on the Atlantic Coast, while the Mackenzie River area of the northwestern interior and the northwestern Arctic islands have the greatest range of between 70° and 80°F. The eastern Arctic does not have nearly as warm summers as those in comparative latitudes in the interior, nor are the winters as cold, so the range between January and July is reduced to 60°F.

Considering temperature extremes, Canadian data are much more impressive regarding low temperatures than high. Temperatures lower than −40°F. have been experienced in all but the coastal areas and the southern extremities of the country. While the North American record of −81°F. was established at Snag in the Yukon Territory, temperatures lower than −60°F. have been reported from all but the Atlantic Provinces. The highest official temperature in Canada was 115°F. reported from Alberta and a sizeable portion of the southern interior of the country has had temperatures of over 100°F. Mention should also be made of heating degree-days, a concept useful in estimating fuel consumption. A study of these units reveals both the severity and duration of cold weather in northern Canada. Computed to a base of 65°F., heating requirements in southern British Columbia, southern Ontario and Nova Scotia are generally less than 8,000 degree-days annually, but this value increases to 16,000 in the Hudson Bay region and to 24,000 at the extreme northern edge of Canada. With further reference to temperature it must be remembered that in the presence of strong wind speeds the sensible temperature is much lower than the actual temperature. Computation of a value known as the wind-chill factor reveals that these factors, based on wind speed and temperature, are higher to the west of Hudson Bay than in most other areas with Arctic climates.

More precipitation could be used to great advantage in agriculture and forestry over a large portion of Canada. Generally speaking, areas with less than 20 inches a year (Fig. 3) in the southern half of the country are sub-humid, while all Canada, except perhaps the coastal regions, could beneficially use more summer rainfall in a normal year. Precipitation is not equally distributed; while the Pacific Coast averages more than 80 inches annually, the prairies have 15 inches and the Arctic less than 10 inches. Precipitation is greater in