

generally called "cold waves." This polar pressure system may be briefly described as a tendency for dry cold air to move from high latitudes and to overspread the interior of the continent. This tendency is most marked in the winter months, when the dryness and cold reach a maximum and the area so affected is also in general at a maximum.

There is also a high pressure system which is most often apparent on the Pacific, and another on the Atlantic. That of the Pacific tends to move moist air upon the continent at all seasons, and so also does that of the Atlantic. That of the Atlantic, however, is generally much warmer and carries much more moisture. Its progress into the interior, moreover, is not impeded to any great extent by topographical features, while influx of air from the Pacific encounters the obstacles presented by the mountain chains paralleling the coast.

With these meteorological generalizations in mind, we should remember that precipitation is the deposition of part of the moisture carried over the continent by the atmospheric currents. While the actual mechanism of rainfall is still a controversial subject (the student is referred to the recent publications of Sir Napier Shaw in England and of Prof. Bjerknes in Norway), it is admittedly due to dynamic cooling of air masses carrying water vapour. This dynamic cooling, which reduces the temperature of the water-carrying air to the saturation point, most readily and often takes place along the margins or fronts of these pressure systems, or in the regions towards which they converge. Seasonal extensions of these high pressure systems, therefore, by varying the regions of convergence of opposing masses of air, vary the place of maximum precipitation.

During the winter months the long nights and the rapid cooling which is characteristic of land areas, combine to create a bias towards cool air from the Rocky mountains eastward. The Great Lakes, Hudson bay, the St. Lawrence and the general proximity of the Atlantic ocean, with no lofty mountain chains to lessen its moderating effect, serve to restrict this area of rapid cooling in the eastern part of the continent. There is, therefore, in the western interior of the continent, during the later months of the year, a bias towards cooling which permits the extension of the polar high pressure system to take place most easily in that direction. For this reason the western grain regions are, from September to the following spring, mostly overlaid by cool or cold dry air. This is then, quite naturally, a season of scant precipitation, and intense but dry cold spells frequently recur. The margin of this pressure system, as we have seen, with difficulty invades the region of the Great Lakes. Ontario, therefore, and particularly southern Ontario, still lies in fall and early winter in the debatable ground between the polar and Atlantic pressure systems. This season in the Great Lake and St. Lawrence regions is frequently wet and less often visited by extreme cold.

In British Columbia the rainy season commences in the autumn when the increase in intensity of the polar pressure system begins its seasonal acceleration.

With the approach of spring, lengthening days and more intense insolation, the polar pressure system in the average year lessens in intensity. Land areas, always more easily heated or cooled than water areas, under the northing of the sun now show a bias towards heating. With these conditions established there is a ready influx of warm moist air from the Atlantic and the tropical waters into the interior of the continent, especially the southwestern interior. The polar front retreats towards the north, but in the extreme northeast the retreat is slow. This lag in the northeast may be attributed to the effect of Hudson bay and strait, which during the winter have taken on the character of a polar sea, recovery from which