pressure becomes higher over the continents than over the seas, and, consequently, the tendency is for air to move from land to sea during the winter, while in summer, when all the continents become warmer than the oceans, the reverse holds. But the winter effect of contracting atmospheric lower strata is in operation more or less throughout the year over the ice-covered arctic seas and over Greenland, with the result that in summer the barometric pressure is a little higher in the polar regions than in the middle latitudes.

Cyclones and Anticyclones.—This general average distribution of pressure has an important bearing on Canadian weather. Another important factor to be considered is the influence of anticyclonic and cyclonic areas. We have mentioned the west to east drift of the air over the middle latitudes, and it is within and more frequently towards the northern limit of this drift, that the phenomena of the travelling anticyclone and cyclone are found. The anticyclonic area is a disturbance in the general drift of the atmosphere, usually of enormous extent, within which the air is moving spirally outwards from the higher to the lower pressure. Within this region the weather is generally fine and settled. The cyclonic area is also a disturbance, varying from a few hundred to more than fifteen hundred miles in diameter. It may be elliptical or circular or very irregular in form, and within its boundaries the air is moving inwards from a higher to a lower pressure. This is the region of unsettled and stormy weather.

The anticyclones and cyclones, designated as areas of high and low pressure, or more shortly as highs and lows, pass across the North American continent in constant procession from west to east, at velocities averaging 20 miles in summer and 30 miles in winter. The highs, especially those first appearing in the more northern regions, have a tendency towards a southeastward course, while the majority of the lows have a more directly eastward movement, the mean average track being from British Columbia to the Great Lakes and thence to Newfoundland. It is the passage of these high and low areas which brings to us the changing winds and weather, warm showery weather being associated with the lows, and fair, cool or cold weather, according to the season, with the highs. As example, the barometer is high in say Ottawa and Toronto, and begins to fall as a low approaches lake Michigan, the wind sets in from the east or southeast, cloudiness increases and within twelve hours conditions are more or less favourable for rain. Rain falls continuously when a warm, moist, expanding and hence cooling air is passing slantingly upward over a barrier of relatively cold air, and these conditions are frequently found in advance of the low, more especially in the colder seasons, and occasionally in summer. But in summer it is more often that the rain partakes rather of the character of showers, perhaps with thunder, and this occurs when, with the heating of the land, upward moving, convectional, and hence rapidly cooling currents, become prevalent. It is often thought that if only water vapour in the cloud would fall as rain, it would be sufficient for all purposes, but this is not so; the actual amount of water in the cloud is not much greater than is often obtained in a heavy dew. Before an abundance of rain can be obtained, it is necessary to feed the cloud with a copious supply of water vapour. This supply is obtained when the centre or trough of lowest pressure approaches the place of observation, and the rain usually becomes heavier, and as it passes, the wind shifts to the northwest, not infrequently with a squall, and the barometer begins to rise in advance of an oncoming area of high pressure, accompanied by clearing weather. Such is an ordinary sequence of events over the larger portion of Canada.