the Canadian northwest provinces, and on the highest parts of lofty mountains.

The cause of the production of halos by means of snow crystals was known as long ago as the time of Newton, who wrote on this subject, and it was perhaps known for a longer time. The one who gave the most stimulus to the subject in modern times was Auguste Bravais, a French scientist, who wrote about twothirds of a century ago. It was Bravais, for example, who first pointed out that "mock suns" are due to refraction through crystals all having their longer axes vertical (a view that has been generally adopted by scientists), and he enunciated several other fundamental principles in the theory of halos, now generally accepted.

As an example of how the formation of the halo takes place. we may select the case of the ordinary sun circle at 22°. A snow crystal near the line from the sun to the observer sends out a spectrum of its own size, another sends out another spectrum, and so on, until the entire circle is built up. The eye of the observer, looking at 'he snow crystals in the minimum position, catches only those spectra that pass in his direction, although all other snow crystals in the air having the proper position re refracting each a spectrum in some direct in at the same time.

The snowline in this latitude in midsummer is 9,000 or 10,000 feet, about two miles or three kilo setres, so that in the very hottest weather of summer we are never more than two miles distant from snow at any time.

It is important to realize rightly in what stratum of the air halos usually occur; they are in the region above the clouds, as a rule, viz., in what has been called the "stratosphere," doubtless because of the diffuse condition of its cloud matter. This stratum is the cirrus haze above all the forms of definite clouds that we know. The haze occurs in the lower parts of the stratosphere, and probably also extends far up into it, at certain times.

The thinness of the haze-film or sheet determines the visibility of the halo. If the haze is too thick, there is no optical effect. The play of colors in the soap bubble and in thin crystals occurs