East leaves the air behi[illegible] and causes thus a N.E. wind, north of the Equator, and a S.E. wind south of the Equator. These winds blow steadily and are known as the Trade Winds. (It is well to bear in mind just here that, with evident modifications, from the shape of the continents, the ocean currents are governed by the same laws.) Outside of the region of trade winds, i. e., from 30° to 60° north lat. is a zone noted for its alternate winds; winds from the southwest alternately with winds from the northeast —the southwest prevailing. This is the belt of the Return Trades, or Anti-Trades. As the trade winds get their direction from the motion of the earth, which glides, as it were, from under the cool winds moving equator-wards—so the anti-trades passing northwards retain the westward motion gained at the equator, and in latitudes not so progressive they outstrip the motion of the earth and thus give rise to southwest winds. But these have not the persistency of the genuine trades of the equatorial regions, and so merely alternate with the polar winds from the northeast.

Such being the state of things in the wide belt including such a great part of the continent, we may now take up the local modifying influences. Consulting our map, we notice a lofty barrier along the west coast—in fact a number of successive ranges of mountains. The point most interesting to us is where the coast range is broken by the inlet called the Straits of San Juan. And here let me call attention to the peculiar elbow made by the ranges nearest the ocean, the direction changing from due north to northwest—best seen on a globe. Next note that all the ranges are much lower here than further south. The coast range south of 49 rises up like a great wall, and the inner ranges are still loftier. North of 49° the mountains decline, except some peaks, till in Alaska they become quite low. The number of passes too and their low elevation were long remarked in view of the prospect of a railway through Canada. Then the valleys of the Fraser and Columbia give unmistakeable hints of passages through the mountains, which furnished a pathway for the winds long ages before the adventurous railroad builder threaded his way across and through the labyrinth. The southwest winds then, blowing warm from the Japan Current, the Gulf Stream of the Pacific, brought to a focus, as it were, in this angle of the mountains, crowd onward through the river valleys, over the lower ranges, across the sea of mountains of British Columbia, and finally breasting the last great wall of the Rocky Mountains, make their final leap down into the plains below.

Having thus traced their course over the mountains, let us inquire into their adventures in this journey of 500 miles.

On leaving the Pacific they are warm and heavily laden with moisture. The first range they meet takes toll from their burden. Heavy clouds are formed and rain falls. The process is repeated at each successive range. In higher regions the scanty supply of moisture now becomes snow. In lofty altitudes, almost completely robbed of moisture, they become greatly rarefied and very cold.* Moisture is gone and heat is gone. Our problem is still unsolved.

Let us now retrace our steps to the coast, and examine into the question of heat, for modern science declares that that is never lost any more than any other force of Nature. We find that in each condensation, first cloud, then rain and snow, heat is produced—to speak accurately, latent heat becomes sensible. Rain and snow remain behind, are lost absolutely to the air currents. Not so the heat: this remains with the air, and seems to be increased. But in the lofty regions of the Mountains rarefaction takes place, and this uses up heat. It requires heat to produce rarefaction, or disappearance of heat accompanies rarefaction, put it which way you will, the heat is not lost, and when, pouring down the mountain side, the great volume of dry air becomes condensed again in lower altitudes, this heat, latent away up in the lofty peaks, now comes out from its hiding-place, and the dry and warm air proceeds to business by licking up the snow, not leaving behind even the moisture caused by its melting. We are speaking now of the winter. Not much heat can be lost in contact with the dry snow, and what is lost by radiation into space may be made

* In spite of the great cold of the lofty range of the Rocky Mountains proper, the snow line is much higher than in the coast ranges, and glaciers are comparatively rare, the simple reason being that the moisture of the air is exhausted on the first range and there is not sufficient snow to form glaciers. This difference in the height of the snow line in the Sierra Nevadas and Rockies in the same latitude amounts to 3,000 feet.