short days of winter. This in brief is the explanation of the Chinook winds.

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Some other considerations remain to be noticed. The time, as I have just said, is winter. In the long melting days of early summer, over the dissolving snows of the ravines and warm slopes, over thousands of foaming terrents and countless rivulets, the stead of gaining heat no air inloses now it by the reverse operations of liqueand evaporation and thus faction chilled it drops on the ill-fated potato patch in the form of June frost.

This matter of heat being absorbed by thawing and set free by freezing is one of common observation. The chilly feeling of a March or April day is shiveringly in the memory of all of us who in early life braved the inclement skies of Ontario. And some of us have known the farmer's plan of saving his potatoes by carrying water into the cellar on an extra cold night-the water giving off in the process of freezing, heat sufficient to save the vegetables. Of course the process does not ge on ad infinitum. But the process of heat disappearing by the rarefaction of air and becoming sensible again on recondensing-this is not so much within the range of our daily experience. The falling of the barometer before a storm is due to rarefaction of the air, and we have all noted the increasing poolness at such a time, though almost invariably this is accompanied by the formation of clouds which quickly shut out our great source of heat, the sun, so that the lesser cause of coolness is obscuted by the greater. Those who have ascended mountain peaks have observed (1) the rarity of the air and (2) the coolness. They may now consider if the latter is caused by the former as post hoc is not always propter hoc

Suppose they are not related as cause and effect, but only accidentally. Then, first, why is it it warmer near the sea-level? It cannot be the earth simply which gives the heat, for then, a high plain, or even a mountain peak, might be as hot as the low level, and second, we know that heated air rises, so the higher the elevation the warmer should be the air. The fact is, nature does not work for nothing, or with nothing. If a gas, air for example, becomes rarified-and it will if it gets a chance-heat is used up in the process. And when the re-condensing

up by the heat of the sun even in the all of it. Nature is not a banker and knows nothing of discount. When a spring is compressed, its power lies dormant. You wind up your watch, you are only storing up the force exerted by the muscles of your fingers, and the spring will give back all the force again, minus the friction, of course. I have dwelt at some length on this point because it is one in which the greatest incredulity is manifested, and all sorts of theories have been projected from the refusal to believe that warm winds can come from snow-clad mountains.

> When Sir Alexander MacKenzie first wintered on the Peace River, away up in lat. 56°, like a second Balbea, looking out in his mind's eye over the great Pacific, he saw the striking effect of these south-west winds and noted in his journal that the ocean could not be far away. Little did he think that nearly 600 miles of rough mountain lay between him and its warm shores. This was in 1792. He remarked the difference between the effect there at the mouth of Smoky River, where the snow disappeared in a few hours, and at Fort Chipewyan on Lake Athabasca, 300 miles further east, where no thaw occurred, though the wind broughtdelightful clear weather.

It is only a few years since one of those indefatigable slaves of nature, a German doctor-what should we know but for the German doctors?-worked out a mathematical demonstration of the amount of heat made latent by rarefaction in the higher altitudes and regained by condensation; and, still more, the amount of heat caused by the precipitation of moisture as the wind rises up the slope of the mountain. This calculation, 1 may say, seems to have been undertaken to solve the same problem in Europe, for they have, it seems, chinook winds under the les of the Alpu and the mountains of Norway, only chinook is not the German name of it. It is said that even the west coast of Greenland is visited by such a wind coming over the elevated land of the interior.

Not to pursue the somewhat wearisome details, we may briefly outline the calca-The estimated heat lost in the lation. ascent of the mountain slope by rarefaction is 1 ° C. for each 100 metres of elevation, and 1° of course is regained in falling. But as we have seen that considerable heat is given off by the condensation of vapor to rain and snow, takes place the heat is given off again, this loss of 1 % is reduced to 1 ° 0.