

On all hands it is admitted that 200 years ago a numerous population existed in New Zealand, which, since that time, has been gradually on the decline, chiefly on account of the exterminating wars carried on amongst the natives themselves. And, if the population culminated more than 200 years ago, will 150 years be sufficient for the increase of a few immigrants in sufficient numbers so as to render a large country like New Zealand comparatively populous?

In all their traditions, treating of nearly four centuries of time, have any accounts of the M<sup>o</sup>a been handed down to us? The inevitable conclusion is, that the M<sup>o</sup>a was either exterminated long before by another race, or that the present inhabitants arrived here not 350 years ago, but 1,350; and that one of their first works was the extermination of the M<sup>o</sup>a. Such is my opinion on the subject.

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ART. VI.—*On the Hot Winds of Canterbury.* By ALEXANDER MCKAY, of the Geological Survey Department.

[*Read before the Wellington Philosophical Society, 12th September, 1874.*]

THE north-west winds, which throughout most of the summer months prevail in the Province of Canterbury, are generally regarded as dry and hot winds, and an unmitigated curse to the country. Their ravages throughout the agricultural districts and the discomfort they occasion are sufficiently well known; their character, as there developed, seems to have been applied to the whole province as a rule. It has also been given in explanation of the very different character of these winds on the two opposite sides of the South Island that in their passage across the Southern Alps their moisture is condensed by the extreme cold of these regions, they descending to the lower regions as dry and hot winds. I shall be able to show that this process is but very imperfectly performed by the higher and snow-clad ranges.

As dry and hot winds they are chiefly prevalent on the plains of Canterbury, but only exclusively so at a distance from the ranges that skirt the western borders of the plains. I was resident for twelve months at the Ashley Gorge, Canterbury, during which time north-westers were unusually prevalent, and almost without exception. After blowing for a few hours as a dry wind heavy rain set in without any change in the direction of the wind, though immediately the rain commenced the wind gradually fell away. These rains, however, seldom prevailed to a greater distance than four or five miles in the direction of the plains. What is true of the Ashley Gorge will equally apply

to Oxford and the gorge of the Waimakariri. In a lesser degree it may be to the Malvern Hills and the gorge of the Rakaia. I am also well aware that these rains invariably follow north-westers in the valleys of the Ashburton and the Rangitata, and usually extend for a few miles beyond the ranges in the direction of the plains.

These remarks apply with equal force to the Mackenzie country as far as the Waitaki River, and the boundary of Canterbury with Otago in the neighbourhood of Lake Ohau.

A glance at the map will show that the region thus favoured is by no means an insignificant portion of the Province of Canterbury, throughout the whole of which it cannot be said but that these north-west winds, on account of their warmth and accompanying rains, are an undoubted benefit where otherwise late and cold springs would prevail, greatly interfering with the profits of the sheep farmer. I could not say whether or not the strength of these winds is in any way modified by the height of the mountains, but this, I think, may be safely asserted, that in the Mackenzie country and the neighbourhood of Mount Cook they blow with equal, if not greater, violence than in any other locality that has come under my observation. In this district I had occasion to watch the behaviour of the north-wester very carefully, and a few facts connected therewith may not be out of place.

Lake Ohau forms one of the line of lakes which skirt the eastern side of the main range, and fills the lower part of the valley which lies between Ben Ahau and the mountains to the westward, and is notable amongst all its sister lakes on account of the strong winds that blow here from the north-west. The river which feeds this lake, four miles above the head of the lake, divides into two branches, severally known as the Hopkins and Dobson rivers. Along the valley of the first of these rivers the north-west winds chiefly blow, and are comparatively rare in the Dobson River Valley, it only being when storms of unusual violence occur that the north-wester blows here at all. North-westers occur here at all seasons, but are chiefly prevalent from October till March, the most violent storms taking place in the month of February. North-westers are usually succeeded by rain from the north-west. If rain does not follow after five or six hours the north-wester is met and driven back by a southerly wind. A north-wester may pass down the north-east side of the lake while a southerly wind prevails on the south-west side.

Sometimes when the north-west wind is stronger than usual, and is met by the south wind, neither gives way, and may thus remain stationary within a quarter of a mile for five or six hours.

Usually a north-wester commences about 10 o'clock in the morning, and if it does not rain by 3 p.m., is driven back about 5 p.m. by the south wind.

Storms of the first order will continue for a week, bringing rain at intervals. Those of the second class are usually driven back by the south wind.

Fitful and hot winds invariably die away and are succeeded by rain.

A north-wester may prevail on the lake and the lower part of the gorges, while an equally strong wind may blow from the south in the upper part of the gorge. This is remarkable, as high continuous ranges hem these gorges in on all sides, save that already occupied by the north-west current. Sometimes a north-wester may be seen to drift the snow off the top of Mount Cook in a south-east direction. But on such occasions it has either blown since the previous evening, or commenced before sunrise. North-westers which begin after sunrise are usually indicated by a few light coloured clouds in the neighbourhood of Mount Cook and the higher peaks of the main range. In this region at all times thunder prevails, but chiefly in the winter with north-west wind and rain.

I might have added yet further to these remarks, but I think that I have said sufficient to show "Its an ill-wind that blows naebody guid," and that the north-wester is not quite such a bad friend as we took him to be.

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ART. VII.—*Observations regarding the Hot Winds of Canterbury and Hawke Bay.* By T. H. COCKBURN-HOOD, F.G.S.

[Read before the Wellington Philosophical Society, 25th July, 1874.]

DURING the conversation which took place at the last meeting, after the President's very suggestive address, doubts were expressed as to the hot winds of Australia having any influence upon the climate of New Zealand. The subject is an interesting one, and I take the opportunity of noticing some facts connected with it, which may be worth the consideration of those who have given attention to the meteorology of this portion of the southern hemisphere.

My first visit to New Zealand was in the year 1858. A fierce hot wind which had blown for some days carried us out of Sydney harbour, and filled our sails for a few hours after leaving the coast, when it suddenly dropped, and we encountered one of those severe southerly gales, locally called "brickfielders," which was, however, as they are generally, of short duration. As the dense black storm-drift rolled up along the sea, the red-edged clouds borne on the north-wester could be observed rapidly passing on above it. During the remainder of the voyage we had strong southerly and south-easterly breezes, with cloudy weather and heavy rain as we entered Cook Strait.