

Some of the gorges of the Karangarua are of great beauty, Dovetail Gorge, with its overlapping fern-festooned rock sides and its low rock-pierced pot-holes, being especially fine. Nevertheless no sight in the area is so imposing as the wonderful Douglas Glacier, nor can one imagine a finer alpine view than that obtainable of this great feature from Fitzgerald Flat. The splendid rock precipice, the magnificent cliff of broken ice above, the great fields of névé, and the ridge of lofty peaks culminating in the splendid crest of Sefton beyond, form a spectacle never to be forgotten. The majesty of the scene is heightened by the almost unceasing noise of the avalanches, which descend in quick succession every two or three minutes with deafening and awe-inspiring roar. In that strange, wild, rock-girt valley, with its heaps of moraines and its desolate treeless gravel stretches, no other sound is heard save the strident shriek of the kea or the weird cry of the weka.

I was preceded in my investigations in the Landsborough, Karangarua, and Twain valleys by several gentlemen, among whom may be mentioned Messrs. G. J. Roberts, the present Chief Surveyor and Commissioner of Crown Lands for Westland; G. Mueller, formerly Chief Surveyor in Westland; C. E. Douglas; and A. P. Harper.

The bibliography descriptive of the area under review is limited, and is practically confined to "Pioneer Work in the Alps of New Zealand," by Mr. Harper, though many years ago some accounts of explorations in the Landsborough Valley by Mr. Mueller were published in the newspapers of the Dominion.

RECONNAISSANCE OF MOUNT RADIANT COPPERFIELD.

From the Hermitage, where we completed the reconnaissance of the alpine area adjoining the Karangarua-Landsborough valleys, I travelled northward to Karamea, arriving at that place on the 4th March. While in the neighbourhood of Karamea a rapid preliminary inspection was made of the deposits of copper and molybdenum ores recently discovered in that locality.

The ores occur at the headwaters of the Mokihinui and Little Wanganui. At the time of my visit, the ore-bearing veins had already been discovered occurring at intervals over an area three miles and a half long and one mile and a half in width. Roughly speaking, the general trend of the veins is north-north-east and south-south-west.

The geology of the area is simple. The veins occur in greyish granite, often porphyritic, and are sometimes associated with veins of coarse greisen, into which they not infrequently grade. To the eastward the granites cut argillites, which are sometimes schistose, and to the westward are overlain by limestones and claystones. Much of the granite is massive and well jointed, and, in consequence, would be eminently suitable for heavy masonry, as well as for finer purposes.

The principal copper mineral occurs in the form of chalcopyrite, which contains when pure 34.5 per cent. of copper. With the chalcopyrite are associated malachite, melaconite, and bornite. The chief molybdenum mineral is molybdenite, but there is generally a little molybdate present. With the molybdenum and copper minerals there is always more or less pyrite or marcasite, and these probably carry the small values in gold and silver which most of the ore contains. The gangue-minerals are chiefly quartz and feldspar.

Owing to the wooded nature of the country the outcrops of the veins are in general poor, though some are well exposed, chiefly in the creek-beds. The walls of the deposits are very irregular, especially when the veins become greisen-like. Some six or seven reefs, supposed to be all separate and distinct, had been discovered at the time of my visit, but it was uncertain whether or not some of the outcrops might not be of the same lode.

As the area in which the copper-ores occur has, since my cursory examination, been carefully investigated by Mr. E. J. H. Webb, Assistant Geologist, and is described by him in another portion of this report, it will not be necessary for me to give further details of the geology here.

KARAMEA TO PARAPARA.

Leaving Karamea I proceeded northward to Parapara, by travelling along the coast as far as the mouth of the Heaphy, whence the old track constructed in 1888 was followed up the Heaphy Valley for some eleven miles, and then across the Goulard Downs to the valley of the Aorere.

At the time of my visit the track was in very bad repair in the valleys of the Heaphy and Aorere, where it was much overgrown, but across the open stretches of the Goulard Downs, though practically unused for years, was still in fair shape. After my return to the work being carried on in the Parapara Subdivision, I remained there with my assistants, Messrs. Clarke and Webb, for about two weeks, when I proceeded to Wellington.

INAUGURATION OF WHANGAROA WORK.

On the 29th June I left Wellington, and in company with Mr. E. Clarke, Assistant Geologist, proceeded to the Whangaroa Subdivision, Hokianga, North Auckland. This area contains deposits of copper, iron, and mercury ores, which it was advisable to investigate. A casual inspection of the main geological and geographical features was made with Mr. Clarke, and the principal occurrences of minerals of economic importance visited. The area, which contains Mesozoic, Tertiary, and Pleistocene sedimentaries, and various igneous rocks, is of great scientific interest. A brief statement on the area by Mr. Clarke will be found later on in this report.

RECONNAISSANCE IN THE HEAPHY SUBDIVISION.

Soon after my return to New Zealand from my trip abroad I left for the Heaphy Subdivision, an area of country in the Karamea Division of Nelson, extending to the south and west from the Parapara Subdivision to the valley of the Karamea River. In my absence from New Zealand