

8. RECONNAISSANCE SURVEY OF VOLCANIC ASH SHOWERS OF THE CENTRAL PART OF THE NORTH ISLAND.

(By L. I. GRANGE.)

During the early part of April and from the 28th April to the 9th June of this year the writer examined the volcanic-ash deposits derived from the Rotorua-Taupo-Tongariro zone. The Hamilton, Rotorua, Taupo, Ruapehu, Te Kuiti, and Napier districts were visited. Several soil-forming showers were examined in more or less detail, and information bearing on the incidence of bush sickness obtained. Details of this work will be published in the *Journal of Science and Technology* as opportunity permits.

9. GOLD-BEARING QUARTZ-VEINS NEAR HAVELOCK, PELORUS SOUND.

(By J. HENDERSON.)

From the 16th to the 22nd January I was in the neighbourhood of Havelock, and examined a number of outcrops of quartz veins and prospect cuts on them. A number of samples were taken for assay.

McKay,* in several reports, has described the geology of the district. Briefly, schists form the great part of the country between the valleys of the Wairau and Pelorus rivers, and the whole of it between Queen Charlotte and Pelorus sounds. The foliation-planes have a general north-east strike, and dip north-west, so that younger and less metamorphosed rocks occur along the north-west border of the area. Havelock is situated in this upper part of the sequence, where the alteration is not so complete but that the original texture and composition of the beds still can be distinguished.

McKay notes that the broken, rugged highland west of the Wakamarina Valley is carved from a dip-slope of quartzite and quartzose schist tilted to the north-west, and, further, that most of the ridges of the area have precipitous faces to the south-east, and gentler slopes to the north-west. The present writer also observed that the foliation of the schist similarly controls the shape of many of the mountains and hills of the Sounds district.

At Moetapu Bay, on the south side of Pelorus Sound, five miles east-north-east from Havelock, the general north-east strike of the schists is broken by a sharp, southward-plunging anticline. Erosion along the weakened beds of this structure has formed the valley Moetapu Bay now occupies, also that extending north from the head of Mahakipawa Arm. Along the same line, and probably controlled by the same structure, are the Hikapu Reach of Pelorus Sound to the north, and the valley of Cullen Creek to the south. The straight, swampy-bottomed Kaituna Valley lies parallel with, and about four miles west of, the Moetapu structure. It cuts right through the schist highlands, and gives easy access between the Wairau Plain and Pelorus Sound, for there is no perceptible saddle at its head. On its west side from Havelock to four miles south to the bridge across the Kaituna, on the Blenheim Road, the foliation-planes dip nearly west. On the east side, the ridge between the Kaituna and the Mahakipawa arms shows an extensive dip-slope tilted north-east. These facts suggest that the Kaituna Valley marks some structural change, either a fault or a fold sufficiently sharp to weaken the rocks.

The great bulk of the gold of Marlborough has been won from stream-gravels, the principal diggings being at Wakamarina, Mahakipawa, Waikakaho, Oramalutu, Bartlett Creek, and Top Valley. The first three localities are within ten miles of Havelock; the others are in south-flowing branches of the Wairau, draining the schists and subschists of Marlborough. Quartz veins are known in each of these localities, and one lode at Wakamarina has yielded over 100,000 tons of ore containing gold and scheelite. The lodes of other localities have been worked much less extensively. The best account of the lode-mining in the Wakamarina, Mahakipawa-Waikakaho, and Top Valley areas is given by Downey,† and Hector‡ describes Sutherland's reef, outcropping in the Onamalutu basin, and Turner's reef, near Cape Jackson. The present writer§ also has described and discussed the origin of the lode worked at Wakamarina.

Mr. P. W. Soanes has carried out a good deal of trenching on the hill at the back of Moetapu Point in order to trace a lode found near the beach. The surface soil and loose rocks have been stripped from the hillside about 50 ft. above sea-level, and a formation of shattered schist lying between two well-marked "heads" and containing branching veinlets and irregular masses of quartz, most abundantly near the hanging-wall. Quartz veinlets also occur in the schist on either side of the formation, though much less plentifully. The foliation-planes of the schist strike nearly north, and dip west at about 40°. The hanging-wall "head" strikes a little south of east, and dips south at 70°. The foot-wall "head" strikes east, is nearly vertical, and terminates upwards against the hanging-wall.

The hanging-wall "head" was traced by trenching to a point some 20 ft. higher than the top of the vertical "head," where it turned into the country. It contained a few inches of quartz throughout. It was not certainly found at higher levels, though most of the many cuts put in to the top of the hill (245 ft. above sea-level) contained reef quartz. It should be noted that the schist weathers deeply, and that prospecting, except on very steep slopes, is slow and difficult work.

* A. McKay: "The District between the Wairau and Motueka Valley"—Rep. Geol. Explor. during 1878-79, No. 12, pp. 102-5, 1879. "On the Mahakipawa Goldfield"—Rep. Geol. Explor. during 1888-89, No. 20, pp. 36-44, 1890. "On the Geology of Marlborough and the Amuri District of Nelson"—*Ibid.*, pp. 104-11.

† J. F. Downey: "Quartz Reefs of the West Coast Mining District, New Zealand," pp. 7-16, 1928.

‡ J. Hector: "Reports on Gold-mines in Province of Marlborough." Rep. Geol. Explor. during 1871-72, pp. 119-29, 1872.

§ J. Henderson: "Notes on the Geology and Mineral Occurrences of the Wakamarina Valley." Jour. Sci. & Tech., Vol. 1, pp. 11-15, 1918, and N.Z.G.S., 11th Ann. Rep., p. 6, 1917.