

FIELD AND OFFICE WORK OF THE DIRECTOR.

With the exception of a few brief visits to Wellington on departmental business, I was constantly engaged in field-work from the beginning of August till the end of May. The short period from the 5th to the 10th August was occupied in a casual examination of coal-bearing strata in the neighbourhood of Tiraumea Sheep-station, south east of Eketahuna. From the 14th to the 20th August I was absent in Nelson, where a preliminary inspection was made of the copper-deposits of the Aniseed Valley, with a view to more elaborate investigation at a later date.

On the 22nd August I left Wellington for the Bay of Islands to undertake the mining geological work in connection with the survey of the Whangaroa Subdivision, which was then being prosecuted under Mr. E. de C. Clarke's direction. My time was spent in North Auckland from the 25th August till the 9th October. Of this period some ten days were occupied in a reconnaissance expedition to the North Cape and Cape Maria van Diemen.

The period from the 12th October to the 21st October was utilised in a brief investigation of the geological and mining explorations being conducted in the Thames Subdivision by Mr. Colin Fraser, and in the organization of the topographical survey under Mr. K. M. Graham in the Waihi Subdivision.

On the 30th October, after a brief stay in Wellington, I left for Nelson, where the systematic survey of the Dun Mountain Subdivision was commenced. The work in this important mineral area claimed my attention until the 13th January, and again from the 12th April to the 27th May.

From the 15th to the 19th January I conducted some rather hurried investigations of the coal-seams at West Wanganui, Pakawau, and Otemataura, and then continued up the Aorere Valley and across the Goulard Downs to the Valley of the Heaphy, where I remained till the 7th February. Most of the remainder of the month and the first week in March were occupied in a hurried inspection of the work being conducted in the Greymouth Subdivision under the direction of Mr. P. G. Morgan, and in a geological examination of the Franz Josef Glacier and immediate neighbourhood.

INVESTIGATIONS AT TIRAUMEA.

The Tiraumea Stream, near the headwaters of which lies the station of the same name, is a tributary of the Manawatu. The area has been examined geologically in the past by McKay and others, and this report may be considered in the main a recapitulation.

On the Tiraumea Estate two series of rocks are exposed — a lower Tertiary series and a pre-Tertiary series (probably early Mesozoic), called by McKay the Rimutaka Series. The latter consist of shattered and often shaly argillites and grauwackes. The argillites are in places reddish and purplish, and frequently contain quartz in small and very irregular lenses. The Tertiary rocks have been classified as Eocene by McKay. The series in the locality under discussion is made up of fine conglomerates, sandstones, and limestones. The beds dip generally at very low angles, though in places very pronounced variation from horizontality is observable. False bedding is conspicuous in the sandstones, which are usually of a yellowish colour, and to a less extent in the conglomerates.

Thin and very inconsistent seams of low-grade coal (apparently sub-bituminous or lignitic in quality) appear in several places on the Tiraumea Estate, notably in Spring Hill Creek, a small tributary of the Ngarangikopo, which again is a tributary of the Tiraumea; and, again, close to the Ngarangikopo, just below the falls on that stream; and, further, near the Tiraumea Falls themselves. The seams are only a few inches thick, and, though they may contain a little fine lustrous coal, in general the material is very impure.

While it is notable that the coal is always seen in practically the same horizon, namely, in the conglomerates and sandstones just above the Rimutaka Series — a fact which suggests a definite stratum — the thinness and great irregularity of the seams and the general impurity of the coal appear unfavourable to the discovery of any definite continuous deposit.

The limestones apparently are generally impure, being either sandy or clayey. Generally, too, the thin beds of a foot or less in thickness are interstratified with beds of claystone, as seen at the Tiraumea Falls. It is proposed to use the limestone as road-metal, for which purpose it will prove of great value. Some of it might later be utilised for cements.

Typical specimens of the limestone from Maire Creek and that from Tiraumea Falls on analysis gave the following results:—

	(1.)	(2.)
Silica (SiO_2)	28.20	33.20
Alumina (Al_2O_3)	5.16	4.97
Iron-oxide (Fe_2O_3)	1.64	1.88
Lime (CaO)	35.25	30.12
Magnesia (MgO)	0.74	0.76
Carbonic anhydride (CO_2)	28.20	24.10
Moisture and organic matter	0.32	3.72
Alkalis and undetermined	0.49	1.25
	100.00	100.00

WORK IN WHANGAROA SUBDIVISION.

The general geological examinations in the Whangaroa Subdivision were almost completed by the time of my arrival in the area. There remained, however, to be done much careful scrutiny of the economic mineral wealth, as well as some physiographic and hydrographic investigation. As the bulletin on the Whangaroa Subdivision is now in press, it is unnecessary here to describe the area in any great detail. However, a few general remarks about this interesting subdivision may be of interest.

The oldest rocks, which have been tentatively called the Waipapa series, are probably early Mesozoic in age. They consist of quartzites, phyllites, argillites, and grauwackes, with interbanded flows