An analysis of a typical sample of the ore is as follows :

| | |
|---|---|
| Silica ($SiO_2$) | 2·89 |
| Alumina ($Al_2O_3$) | 7·69 |
| Ferric oxide ($Fe_2O_3$) | 69·07 |
| Manganous oxide (MnO) | 0·10 |
| Lime (CaO) | Nil |
| Magnesia (MgO) | 0·60 |
| Chromic oxide ($Cr_2O_3$) | 3·25 |
| Loss on ignition | 16·01 |
| Undetermined | 0·39 |
| | 100·00 |

Equivalent to metallic iron 48·35 per cent.

On heating, the sample of ore gave a colour similar to that of Parapara iron-ore when burnt, and, therefore, should be suitable as paint. It scarcely occurs in sufficiently large quantity to be utilised for the manufacture of pig iron.

(4.) *Coal and Peat.*—Small seams of lignite occur in Miocene rocks at the northern head of Parengarenga entrance, and have in a very small way been utilised for fuel ; but they are of very limited extent.

Peat is fairly widespread in the North Cape area, but is especially conspicuous in the uppermost measures of the Pliocene-Pleistocene rocks just south of Cape Maria van Diemen. Here, by the marine erosion of the sandstone cliffs, the peat is undercut, and falls to the beach below in huge chunks. A small stream which enters the sea at this point exhibits good sections on either bank. The peat-beds are in places fully 3 ft. in thickness. In general, the finer part of the peat, which comprises much the greater portion, is highly carbonised, but the larger chunks of wood contained are relatively but little changed. It was in the swamps of which the peat-beds now bear witness that great kauri forests formerly flourished, and fragments of kauri-gum are commonly found in the beds.

(5.) *Glass-sand.*—In the immense deposits of very pure, fine, white sand on the sea-coast just south of Parengarenga Harbour entrance the northern part of New Zealand has a real asset. The sand is formed of tiny grains of pure-white quartz, and forms hillocks of dazzling whiteness.

The sand seems particularly suitable for glassmaking, and, I understand, is used in Auckland to a very limited extent for this purpose. It also could be used to advantage for many other purposes, such as forming silica linings for furnaces, making silica bricks, &c.

## Work in the Dun Mountain Subdivision.

The Dun Mountain Subdivision comprises the survey districts of Maungatapu and Waimea. The area encloses the City of Nelson, and lies just to the south of Golden Bay.

General Geology.—Perhaps no single area of the same size in the Dominion presents such a variety of geological features as does the Dun Mountain Subdivision.

The oldest rocks in the area are a series of conglomerates, agglomerates, and argillites, which have been called Te Anau by the members of the old Geological Survey, and have been classified by them as Devonian. For these rocks we have adopted the provisional name of Pelorus Series, as there seems to be no satisfactory proof of unconformity between them and the Maitai Series which follows. It is possible and even probable that the two series belong to one more or less continuous period of sedimentation. The great series of grauwackes, argillites (red and grey), and limestones which overlies the Pelorus Series and constitutes the Maitai Series is now generally conceded to be Carboniferous in age. Both Maitai and Pelorus rocks have been greatly folded and faulted.

In unconformity with the Palæozoic rocks are conglomerates, sandstones, and shales, with coal-seams and limestones. This series was considered to be Cretaceo-Tertiary by the old Survey. As yet the writer can assign no definite age to these rocks, but it is probable that they are early Tertiary. Though the coal-bearing rocks, which generally dip gently, are in places steeply inclined, this position is due to tilting and faulting rather than to folding.

Above the coal-bearing strata lie the Moutere Gravels, which apparently are the deposit of a great Pliocene or Pleistocene river which flowed northward from Westland to enter Golden Bay. The Moutere Gravels rarely show stratification, and, apparently, are practically undisturbed. The most recent beds consist of the gravels, sands, &c., of the Waimea Plain and the lesser flood-plains, the muds of the tidal flats, &c., &c.

Igneous rocks occupy a prominent part of the mountainous country. These are in the main ultra-basic in type, and consist of dunites and various other peridotites, which are all more or less serpentinised together, with diorites, diabases, and gabbros. A remarkable dyke rock, which we have called nelsonite—a combination of grossularite and diallage—cuts the other ultra-basics. Granitic rocks appear *in situ* just to the east of the area under description, and the pebbles and cobbles shed therefrom are conspicuous in the conglomerates at the base of the coal series and in the Boulder Bank. An amygdaloid melaphyre is interstratified with the rocks of the Maitai Series, and may be seen on the tributaries of the Brook and elsewhere.

Economic Geology.—From an economic standpoint the Dun Mountain Subdivision contains much of interest. The mineral wealth may be discussed under the following headings : (1) Gold, (2) Copper, (3) Chromite, (4) Coal, (5) Cement-materials and Building-stone.

(1.) *Gold.*—Though alluvial gold is of widespread occurrence in the Moutere Gravels, and occurs in almost every stream draining these rocks, it has never yet been discovered in payable quantities. We have obtained prospects in several branches of Eve's Valley Stream, and in one of the streams entering the sea near Bronte Point. Gold is said to have been found in some of the quartz stringers