

V.—TABLE OF FORMATIONS.

Formation.				Characteristic Rocks.
6. Carboniferous (Maitai slates of Hochstetter)	..	..	..	Slaty shales, graywackes, sandstones, crushed breccias, felsites and felsitic tuffs.
5. Lower Eocene (Cretaceo-tertiary of Geological Survey Department)	..	..	..	Clay marls, slate conglomerates, foraminiferal limestones, with small coal-seams.
4. Upper Eocene or Oligocene	..	..	..	Andesites (augite and hornblende) fresh and decomposed, fine-grained tuffs.
3. Miocene	..	..	..	Trachytic and andesitic agglomerates, breccias, and dykes.
2. Pleistocene	..	..	..	River-terraces, lacustrine beds.
1. Recent	..	..	..	Alluvial flats, harbour-muds, swamp-deposits.

In the above table I have included the Lower Eocene sedimentary beds of Cabbage Bay, which, though lying several miles to the north of the district under consideration, are yet essential to the correct interpretation of the homotaxial relations of the beds to be discussed.

VI.—CARBONIFEROUS (MAITAI) SLATES.

These rocks, so far as is yet known, form the basement rock both of the Cape Colville Peninsula and of the North Island of New Zealand. They are the Maitai slates of Hochstetter, forming part of one of the most important groups in the New Zealand sequence, giving rise to the chief orographical features in the North, and playing no inconsiderable part in the mountain structure of the South Island. In the former region they consist exclusively of fine-grained argillaceous slates, but on the west coast of the South Island—viz., at Reefton—they pass downwards conformably into a fossiliferous limestone, the nature of the contained fossils sufficiently indicating the homotaxial relations of the beds. The most important fossil forms are *Productus brachytharus*, *Spirifera glaber*, *S. bisulcata*, *Cyathocrinus*, and *Cyathophyllum*. At Reefton the slates overlying the limestone contain auriferous reefs which have been worked with very satisfactory results.

So far, no distinct fossils have been discovered in the slaty shales of the peninsula, or of the North Island, though indistinct markings which may be of organic origin are mentioned by Mr. James Park, F.G.S., from Tararu, Thames, and from Stony Bay, beyond Port Charles.

In the Coromandel district these rocks consist of fine-grained dark- or light-coloured graywackes and slaty shales and coarse sandstones, together with interbedded sheets of a volcanic rock, which, from its felsitic nature, and from the preponderance of soda in the alkalies, I have termed a ceratophyre. The shales weather readily into a yellowish-white thin soil, forming very poor land. In places, so stained with percolating iron solutions from the adjacent volcanic rocks are the clays, and so brilliant are the blue and red hues resulting therefrom, that they may easily be mistaken for andesitic decomposition products.

The most northerly outcrop of the Palæozoic rocks is in Paul's Creek, which falls into Koputauaiki Bay, about three miles north of the township. Here they are exposed in the bed of the creek for a considerable distance, and consist of slaty shales interbedded with soda-felsites or ceratophyres. To the east and south-east they are overlain by the tuffs and andesites of the Kapanga area. Proceeding east the slaty shales are next met with in the low levels driven into the Tokatea Hill, interbedded with a felsitic rock, which is exposed on the surface on the eastern slope of the ridge, extending from the Tokatea saddle to the Kennedy Bay Flat. The upper portion of this area is traversed by a dyke-like mass with a north-to-south course, and a dip to the west. In this rock, as first pointed out by Mr. A. McKay, bipyramidal crystals of quartz occur, and the rock may well be termed a quartz-porphry. It is apparently intrusive through the surrounding felsitic area. Running parallel and some 20 chains to the west is the main Tokatea reef, and it is worthy of notice that from the area between the dyke-mass and the reef nearly all the gold from the Tokatea Goldfield has been recovered. (See Fig. 1.)

On the western slope of the main range the slates are exposed by a level in the Pigmy Mine, 1,000 ft. above sea-level, and this height represents probably the extreme height to which the slaty shales reach in this quarter.

Mr. James Park, F.G.S., in a report on the Hauraki (Cape Colville) Peninsula, mentions an exposure of slate south of the Kapanga shaft. Here the clays are bright-hued, and resemble much the decomposition product of the slaty shales, but that it is a slate area is disproved by the mine-workings beneath, which are all in decomposed andesite.

The slaty shales are, however, exposed in the creek behind the Upper Township, and from thence outcrop, gradually increasing in breadth south-east for a distance of four miles and a half. Behind the Buffalo Reserve the outcrop is about 30 chains wide, while on the road to the Success Mine the breadth of outcrop is about half a mile, and reaches from 350 ft. to 600 ft. above sea-level. The upper surface of the slaty shales is here well marked by the presence of lacustrine beds of small extent and thickness, including fine-grained clays, fine earthy conglomerates, and small coal-seams. Similar beds occur also further to the south, and overlying the slaty shales. On the Kuaotunu Road the slates have a width of 80 chains, and rise from the alluvial flat to a height of 1,000 ft. The long tongue running out into the alluvial flat south of the Kapanga Township is composed of slaty shales. The exposures along the Kuaotunu Road show the slaty shales weathering to reddish-brown or brown to yellow clays.

In the Karaka Creek, further to the south, the slates may be traced toward the source as far as the falls, which are of considerable height. About 10 to 20 chains above the falls the slate gives place to the overlying volcanic rock. At the junction, and near it, occur several reefs containing a notable percentage of galena and copper ores. These will, however, be described in a later chapter.

Following the base of the hills from the Karaka Creek, the slaty shales are seen to occupy the beds of the several creeks as they debouch on the alluvial flat. From Elmslie's Creek the