*General Geology.*

*General Classification.*—The following classification, based on the general lithological and stratigraphical evidence, is tentatively submitted pending a microscopic and palæontological examination:—

(1.) Ordovician: Aorere Series.
(2.) Miocene: Oamaru Series.
(3.) Pleistocene and Recent: Beach and river deposits; talus slopes.
(4.) Post-Aorere: Igneous Rocks.

(1.) *Aorere Series.*—Rocks of the Aorere Series are confined within the area so far examined to a narrow strip bordering the western and southern flanks of Mount Stormy. They consist of argillites, more or less distinctly bedded, with a south-easterly strike. They are generally schistose and spotted, and occasionally brecciated, effects produced by the intrusive action of the adjacent igneous mass which now forms Mount Stormy. It is probable that further outcrops of this series of rocks will be encountered along the base of the Mount Radiant Range.

(2.) *Oamaru Series.*—The beds which constitute the foothills have been, on account of their stratigraphical relation with somewhat similar beds of known age north of the subdivision, tentatively considered as belonging to the Oamaru Series of Miocene age. The beds are in places highly fossiliferous, and a palæontological examination will remove all doubt as to age. The members of this formation are, in ascending order, calcareous mudstones, with a band of arenaceous limestone, followed by argillaceous sandstones with small coal-seams and occasional beds of loosely consolidated quartz wash, said to be auriferous in places. The maximum thickness of the series within the subdivision is probably about 600 ft. The beds have as a rule a gentle dip towards the coast. Exceptions to this general slight dip prevail, however, round the foot of the mountains, where faulting has caused monoclinal folding with the production of steep inclinations of the strata.

(3.) *Beach and River Deposits, Talus Slopes.*—Owing to the low gradients of the streams and rivers for some miles from their mouths, the coarse material is deposited before reaching the coast, and consequently sandy beaches prevail with mud-flats round the mouths of the watercourses. The flood-plains of the various streams, the occasional terraces flanking the course of the Little Wanganui River, and the narrow coastal plain fringing the present shore-line all show Recent rocks. Talus slopes are common in the mountainous region.

(4.) *Igneous Rocks.*—Intruding the beds of the Aorere Series and forming the main massif in the east of the subdivision, is a huge boss of granite overlain in places by unaltered Oamaru beds. In point of age it thus lies between Ordovician and Miocene, but it is impossible as yet to assign a definite age to its intrusion.

Biotite-granite of grey appearance is the prevailing rock in the western portion of the igneous mass, but bands of pegmatite with large muscovites are not uncommon. Towards the east dark dioritic rocks are frequently met with, and appear to be the effects of segregation from an original granitic magma. The diorites are invariably of fine texture, while the granites are generally of a porphyritic nature. The igneous rocks are of prime importance owing to the cupriferous veins which occur in them.

*Economic Geology.*

The economic possibilities of the subdivision may be tabulated with respect to their relative importance as follows:—

(1.) Copper and molybdenum.
(2.) Gold.
(3.) Coal.
(4.) Lime.
(5.) Building-stone.

(1.) *Copper and Molybdenum.*—Of greatest importance from an economic point of view are the copper-molybdenum veins of the subdivision. These are confined, as far as present examination has shown, to a belt of country three miles and a half long and a mile and a half in width, traversing the western portion of the granite boss in a north-north-easterly direction from the eastern slopes of Mount Radiant to near the summit of Mount Scarlett. Outcrops are said to exist still further to the south, and subsequent examination may prove their continuance in a northerly direction. Reference to the sketch-map opposite will show the general disposition of the veins, and it will be noted that those on the Mount Radiant Range have in general a north-north-west strike, while those on the slopes of Mount Scarlett trend in a north-easterly direction. It is highly probable that many of these outcrops will eventually prove to be connected, thus forming continuous vein-systems. But little work has as yet been done upon them, and there is ample scope for the location of further outcrops by means of surface prospecting.

The veins are sometimes very distinct, with both walls well defined; again, they may be somewhat irregular and greisen-like with indefinite walls, whilst yet again they may have the nature of a stockwork—a reticulated mass of small irregular veins. The vein-material is in the first case usually quartz alone, generally white, though occasionally rusty, with splintery fracture. In the greisen-like veins unaltered feldspar forms a part of the gangue-matter, while in the stockwork formation the country rock also carries values.

The metalliferous constituents of greatest economic importance are the copper sulphides chalcopyrite and bornite, with their alteration-products melaconite and malachite, while covellite, azurite, cuprite, and chalcocite are occasionally to be observed. The various copper minerals generally appear in streaks and bunches irregularly distributed in the vein-material. Not infrequently, however, the chalcopyrite is finely disseminated throughout the gangue, and may occasionally be seen replacing the ferro-magnesian constituents of the country rock.