

The main mass of these sediments occurs east of a line drawn from the Rahu-Maruia junction to the Wheeler Creek-Matakitaki junction. The rocks strike north-north-easterly with minor variations from this direction, and are vertical or dip eastwards at high angles. Greywackes and carbonaceous argillites are the dominant rock-types, and these grade into semi-schists and phyllites or semi-phyllites, according to the amount of dynamic metamorphism they have suffered. Chlorite schists in which magnetite is abundant, outcrop at the head of the "Branch of Glenroy" in the Nardoo Range. Similar rocks crop out in the Cann Range five miles south-westward from Prebbles' hut where they are also garnetiferous. In both localities they are overlain eastward by garnet-mica-schist which grades upwards into semi-schists and greywacke.

A series of greywackes, with interbedded igneous conglomerates which closely resemble the Haupiri conglomerates, outcrops westward from the Station Creek-Matakitaki junction. A considerable thickness of marble is associated with these rocks. The marble again outcrops at Marble Hill and at other localities in the Upper Maruia district. In the Victoria Range, in Mount Mantell, and in Mount Rutland greywackes, metamorphosed in places to hornfels and spotted schists, are common.

Rocks of Tertiary age occupy wide areas in the Upper Maruia district, and extend thence north-eastward into the Glenroy and Matakitaki valleys. A narrow fault-bound strip of these rocks occurs in the "Branch of Glenroy." The rocks, which are of Upper Miocene age, consist of arkositic grits, mudstones, sandstones, and conglomerates with coal-seams or with carbonaceous layers. They strike chiefly north-eastward, and dip at angles varying between 45° and 90°, with the exception of a gently-warped block between the Rappahannock and Glenroy rivers that has dips seldom greater than 20°.

IGNEOUS ROCKS.

Granites and diorites and their basic differentiates form much of Mount Mantell, Mount Cann, and Victoria Range. Great blocks of the fine-grained pre-Tertiary marble, several chains in extent have been incorporated in the Mount Cann granite and recrystallized into a coarsely granular marble. Basic and ultrabasic rocks crop out in Station Creek (tributary of the Matakitaki) and on the Mount Baldy highland.

ECONOMIC GEOLOGY.

Gold.—Gold-bearing gravels in river-beds and on terraces have attracted the attention of prospectors since gold was first discovered in the district, shortly after 1860. Much labour and capital have been expended on alluvial mining, but with the exception of some claims at Horse Terrace the returns have been unsatisfactory. The principal gold-bearing areas are the Matakitaki from Horse Terrace down-stream towards Murchison, the Glenroy from Granity Creek junction to the Matakitaki junction, and the Maruia from the vicinity of Warwick Junction northward. At present some leased areas in the Upper Maruia are being systematically prospected by the Siamese Tin Co. The distribution of payable wash is so closely associated with the distribution of Tertiary conglomerates that it seems the bulk of the alluvial gold has been derived from these conglomerates. This opinion was first expressed by Cox*, and later it received support from McKay†.

As a rule, the pre-Tertiary rocks are barren, but in Branch Creek, a tributary of the Matakitaki, the quartz stringers associated with them have yielded some "specimen stone," though recent careful prospecting in this locality has revealed nothing of value.

Coal.—Bituminous and sub-bituminous coal crops out at several places in the district, but the seams appear to be thin and much crushed. The measures are the equivalent of the coal-measures at present being prospected in the Murchison Subdivision, at Owen Junction and in the vicinity of Murchisor.

Oil.—For many years seepages of oil have been known to occur near Warwick Saddle and in some tributaries of Blackwater Creek. The oil seeps out along the fault- and fracture-planes in the steeply-dipping Tertiary rocks.

As interest is being taken in the oil possibilities of the Murchison and Maruia districts, prospective investors should consider carefully the authorship and the value of geologic reports submitted to them. The success of many ventures depends upon a correct interpretation of the geologic structure of the district, and to obtain this much preliminary field-work is essential. The prospects of success may be seriously jeopardized by acting on the advice of an incompetent individual or before the structure has been correctly interpreted.

Copper.—Sulphides of copper, mainly chalcopynite, occur in a few small reefs associated with the ultrabasic rocks of Mount Baldy highland.

Wolframite.—The tungstate of manganese ($MnWO_4$) was prospected with unsatisfactory results in a branch of Warwick Creek on the east side of Mount Mantell.

Roadmaking-materials.—Granite, greywacke, Tertiary conglomerates, terrace-gravels, and river-shingle yield an inexhaustible supply of roadmaking-material throughout the district. The terrace-gravels and river-shingle, being easily obtained, are used to a greater extent than are other rocks that require quarrying.

5. MURCHISON SUBDIVISION.

(By H. E. FYFE.)

Certain portions of Maruia and Lyell Survey Districts that are very difficult of access were not completely mapped during the 1927-28 field season. During the past season these were mapped as opportunity permitted. Apart from the completion of the regional mapping, few additional geologic or economic results have been gained. For short accounts of the geology of the subdivision see 20th Annual Report, N.Z. Geological Survey, pp. 11-12, 1926; 21st Annual Report, pp. 4-7, 1927; and 22nd Annual Report, pp. 11-14, 1928.

* Cox, S. H.: Rep. Geol. Explor. during 1883-84, No. 16, p. 9; 1884.

† McKay, Alexander: "Report on the Geology of the South-west Part of Nelson and the Northern Part of the Westland District." Mines Report, C.-13, p. 3, 1895.