

greywacke west of the Maitai rocks is assumed to be Triassic from its degree of metamorphism.

Tertiary beds have been strongly deformed by faulting and folding. The early Tertiary (Eocene to Oligocene) beds are represented by a shallow-water and a deep-water facies. The two facies have no formation in common and are separated by a major fault. Tertiary beds include Upper Eocene coal measures, conglomerate, and marine sandstone; Oligocene mudstone, limestone, graded-bedded sandstones, and mudstones; Miocene conglomerates and marine mudstones; and Pliocene freshwater mudstones and conglomerates.

Post-Tertiary beds consist of horizontally bedded alluvium, beach sands, and boulder deposits.

The Stratigraphic Table of Nelson City Area is set out in Table I.

Brook Street, Maitai, Tertiary, and post-Tertiary rocks cover approximately equal areas. More than 60 thin sections of Brook Street volcanic rocks were examined and four new formations were recognised. Maitai rocks were examined in less detail and already recognised formations were adopted. Tertiary rocks were mapped in greatest detail and have been divided in terms of New Zealand stages. Post-Tertiary deposits are not extensive.

BROOK STREET VOLCANIC GROUP

The rocks of Brook Street Volcanic Group were described by Hochstetter (1864: 232, 245) as a "Mesozoic Group" of partly crystalline, amygdaloidal and brecciated diabasic augite-porphyr. McKay (1879: 115) noted calcareous slates with "*Inoceramus*" fragments and bands of impure limestone associated with the igneous rocks. He grouped them under "Aphanite Breccia" and "Serpentine Belt" and assigned them to his Te Anau Series. Bell, Clarke, and Marshall (1911: 40) recognised the rocks as altered olivine basalts and tuffs, classed them as melaphyres, and grouped them with the Maitai Series, which they regarded as Trias-Jura in age.

The name Brook Street Volcanic Group is used here for a belt of Upper Paleozoic volcanics and sediments that lies on the west side of the Maitai belt from D'Urville Island to the Wairau Fault near Tophouse (Fig. 1). The two belts are in fault contact for their whole length, and their stratigraphic relation cannot be determined. Stratigraphic relation is established in Southland, where the Takitimu Group, the correlative of Brook Street Volcanic Group, is overlain unconformably by the Productus Greek beds, the correlative of Maitai Group (Mutch, 1957: 502).

In the area mapped rocks of Brook Street Volcanic Group crop out between Brook Valley and Flaxmore Hill and extend north-eastwards to the boundary of the map (Fig. 2). They have been strongly tilted but do not appear to be significantly folded. Exposures are numerous, but deeply weathered. The best localities are Brook Street, Maitai Valley and Upper Bishopdale quarries, and the banks of the Maitai River near the city. The rocks have a steep easterly regional dip. The greatest apparent thickness within the mapped area is 12,000 feet at the north boundary. The Brook Street Volcanic Group is separated from the Maitai Group to the east by a major fault, along which a narrow strip of lower Tertiary coal measures and marine sandstone is infaulted. The fault seems to be a continuation of the Waimea Fault of McKay (1892: 20). To the west the Brook Street Volcanic Group is separated from Tertiary sandstones of Upper Eocene to Oligocene age by Flaxmore Fault.

Four formations are distinguished by the writer:

Botanical Hill Formation (top faulted by Flaxmore Fault)