to those of the Wether Formation and also similar to the Waiua Formation, which, however, overlies the Glennie Formation. The laminated argillites in the lower part of the formation at grid ref. 335808 grade laterally into the Tramway Sandstone, but most of the Greville Formation is younger than the Tramway Sandstone.

Waiua Formation

The Waiua Formation was not studied in detail. The boundary between it and the Greville Formation was taken as the western limit of the mapped area. As elsewhere (Waterhouse, 1964), it consists predominantly of laminated red and grey argillites, but a coarser facies of a speckled red and green sandstone is exposed in the Motueka River at grid ref. 320855.

Age of the Maitai Group

The age of the Maitai Group is discussed by Waterhouse (1964) who gives a Kazanian age for the Wooded Peak, Tramway, and Greville Formations.

TORLESSE GROUP

The name Torlesse Group was formally proposed by Suggate (1961) for poorly fossiliferous non-schistose greywackes and argillites that lie to the east of the schist belt in the South Island of New Zealand. These rocks have been earlier described as undifferentiated greywackes (Grindley, Harrington, and Wood, 1961) or part of the Alpine Facies (Wellman, 1956). The Torlesse Group occurs to the south of the Red Hill area as a monotonous succession of beds of redeposited facies. Generally the rocks are grey to greenish-grey greywacke sandstone and dark-grey argillites. Microscopically the rocks are poorly sorted and are composed of angular fragments of quartz, microcline, and plagioclase. A typical example (10949) is a quartz-feldspathic wacke comprising a matrix (fragments less than 0.1mm) 40 percent, quartz fragments 40 percent, microcline 10 percent, plagioclase 5 percent, and accessory sphene, biotite, and muscovite. Incipient recrystallisation of the matrix is shown in weak development of pumpellyite and veinlets of prehnite. A few miles east of the mapped area, a lens of fossiliferous limestone occurs in the Torlesse Group (Lensen, pers. comm.). The fossils have not been definitely identified but indicate a probable Triassic Age.

Although of similar depositional environment, the Torlesse Group differs from the Pelorus Group in age and provenance. Whereas the Pelorus Group is derived from basic volcanics, the provenance of the Torlesse Group, as indicated by microcline, sphene, biotite and abundant quartz, is granitic. In this respect the Torlesse Group of the Red Hill area is similar to the Mesozoic greywackes and argillites of Wellington as described by Reed (1957).

QUATERNARY DEPOSITS

The geological map of the Red Hill area shows two types of Quaternary deposits: river gravels and moraine. River gravels cover the Wairau Valley bottom and extend several hundred feet up the valley walls. Aggradation terraces of several ages are preserved, the highest of which is about 400ft above the river. Some river gravels contain interbedded consolidated siltstones which dip at about 20°. Most of them are probably middle to early Quaternary in age, but others are superficial Recent deposits. Small areas of moraine cover part of the Red Hill Complex and are evidently the remains of an extensive sheet that developed during Quaternary glaciations. Most of the moraine is composed of rounded and subangular boulders and pebbles of ultramafic rocks set in a very poorly sorted, strongly cemented matrix. One patch of moraine, at grid ref. 356740, is composed of angular and well-rounded fragments of limestone, Tramway Sandstone, and argillites. It occurs