The sequence of the Mesozoic formations is on the whole well exposed and the classification of them should be reliable. The Palæozoic beds are not sufficiently characteristic to establish definite conclusions. A little additional evidence about them has been obtained, and this shows that part of the series is upper Palæozoic and part older. The less known parts are correlated on scrappy evidence.

Series.	Rocks.	Thickness in Feet.	Characteristic Fossils.	Age.
..	Clay, sand, gravel ..	..	..	Recent and Pleistocene.
Tertiary (?)	Clay, lignite ..	100	..	..
Caversham	Calcareous sandstone, greensand	350	*Pachymagas abnormis*	Basal Awamoan.
Burnside	Calcareous mudstone, coarse sandstone	350	*Callolima* ..	Ototaran.
Wangaloa	Glauconitic mudstone, coarse sandstone	1,000	*Conchothyra australis*	Top Cretaceous.
Brighton	Shell limestone ..	100	*Dimitobelus* ..	Cretaceous.
Taratu	Quartz conglomerate	1,000	No fossils ..	Cretaceous.
Kaitangata	Schist conglomerate	3,000	No fossils ..	Cretaceous.
Putataka	Sandstone, current-bedded and carbonaceous	3,500	*Inoceramus haasti* ..	Bathonian and Oxfordian.
Bastion	Carbonaceous sandstone, conglomerate	4,300	*Pleuromya* ..	Middle Triassic.
Warepa	Spheroidal sandstone	1,100	*Pseudomonitis richmondiana*	Noric.
Otamita	Mudstone, sandstone	2,500	*Maoria problematica*	Carnic.
Oreti	Siliceous greywacke	4,000	*Halobia zitteli* ..	Carnic.
Kaihiku	Sandstone, greywacke, conglomerate	7,000	*Daonella indica*, *Spirgera kaihikuana*	Landino-Carnic.
Clinton	Coarse greywacke, conglomerate	10,000	*Zaphrentis*, *Chonetes*	Permian or Carboniferous.
Tuapeka	Dense greywacke, schist	100,000	No fossils known ..	Palæozoic.

Tuapeka Series.—The lowest fossiliferous bed is at Clinton and with it are classified the adjacent strata, including several beds of conglomerate down to a strong conglomerate that separates two different types of greywacke, a coarse-grained greenish red-spotted greywacke above, and a dense dark fine greywacke below. This lower greywacke grades into obscurely bedded more siliceous greywacke and into gradually more changed beds till it forms the well-known mica schists with crenulated quartz laminæ. The Tuapeka Series includes the schists, the less metamorphosed rocks, and the greywacke. The less metamorphosed rocks are not, however, the equivalents of the schist, for no place is recorded where the schist grades along the strike into greywacke. All the sections described to show the gradation are across the strike from lower beds to upper ones. Besides the common grey mica schist green chloritic schist is common, and pink and light grey schist are less common. The less metamorphosed beds include silky phyllite, semi-schist, schistose greywacke, &c.

These beds are continuous with the schist and greywacke of the Tuapeka Subdivision described by Marshall in Bulletin 19 as the Tuapeka Series.

Since Hutton suggested the structure in 1875, it has generally been accepted that Otago is an anticline trending north-west. The evidence supporting this idea is derived from the northward dipping Mesozoic Kakanui mountains forming the north flank and the parallel southward dipping Mesozoic Kaihiku mountains, eighty miles distant, forming the south flank. No evidence has been obtained to show that the schist is anticlinal. The statements as to the attitude of the beds given in Park's bulletins are strongly opposed to it, and so are the attitudes of the beds mapped by Marshall in Tuapeka. Similarly, in this subdivision the beds do not indicate an anticline, but dip inwards for ten miles on the north side and six miles on the south side towards Taieri Mouth.

The evidence is not favourable for the simple, anticlinal structure of the schist; but it is too poor to support a conclusion about the regional structure. The Kakanui and Kaihiku Ranges appear as ramps rising over a depressed block of schist.

As the schist and greywacke of the Tuapeka Series, where their relation can be seen, underlie the Clinton (upper Palæozoic) fossiliferous beds, they cannot be Trias-Jura, but must be pre-Carboniferous. The schists are metamorphosed sediments and it would be profitable to ascertain when they were metamorphosed. The pre-Kaitangatan conglomerates contain many pebbles of greywacke but none of schist, which indicates that no schist was exposed when they were forming. It may be that the old land had a cover of greywacke protecting an undermass of schist; but it appears more probable that a land containing schist would have yielded some pebbles of schist. Accordingly, in this report it is inferred that when the conglomerates of greywacke without schist were forming the land consisted of unmetamorphosed greywacke. This means that the beds were metamorphosed by the Hokonui movements at the end of the Jurassic. In agreement with this, hand specimens of the Kaihiku beds at Mount St. Mary are sub-metamorphic, contain Triassic fossils deformed through the alteration of the rocks, and are described by Park as passing gradually into the highly schistose rock at the base of the series.