Bastion Series. — In the subdivision no fossiliferous beds were found corresponding to the Rhaetic, Lower Lias, or Middle Lias. The first fossiliferous bed found above the *Pseudomonotis* bed is 70 chains away from it, across the strike of beds dipping at 50°, and is accordingly 3,500 ft. above it. The fossil is *Pleuromya*. Trechmann regarded the Hokonui Hills *Pleuromya* beds as Callovian (Lower Oolite) and Spath classed the Kawhia *Pleuromya* beds as Toarcian (Upper Lias).

The base of the Bastion Series is taken as being at the coarse conglomerate close above the *Pseudomonotis* bed, and the formation extends up to the thick sandstone, with layers of plant remains forming the ridge above the Duke's Nose and running from Trig. H, in Warepa Survey District, through the Dromedary and Trig. P, to Brown Dome. This includes three strong hogbacks of sandstone separated by valleys eroded along mudstone, and can readily be subdivided when more faunas are found. Along Little Puerua Stream this formation extends for a mile across beds dipping at 60°, and is evidently 4,300 ft. thick. In the south the beds dip south at 40° for half a mile and in the next half mile to the north they turn up to vertical as if thrust from the south at a fault contact. East of Rocky Dome the underlying Warepa and the basal Bastion beds dip south at 80° for five miles along the strike to the boundary.

Dr. Marwick has identified among the fossils collected from these beds indistinct specimens of *Cucullaea, Pleuromya, Modiolus,* and *Tellina.*

Putataka? Series.—No fossils corresponding to the Flag Hill Series of Cox and McKay distinguished by Spirifers and Belemnites were found, but their next series in the Hokonui Hills, the Putataka, characterized by *Inoceramus* and *Astarte,* appears to be represented by an *Inoceramus* bed that crops out for a mile along the strike on the dip-slope a quarter of a mile north of Trig. N, in Warepa Survey District. The Flag Hill fauna and the lower Putataka fauna are missing. The hogbacks dip steeply about 60°, and the beds appear as a normal sequence of concordant dip-slopes as if eroded from a parallel series of beds. The evidence is, however, scrappy. The basal bed is in places current bedded, in places full of magnetite corresponding to an old black-sand beach, and in places full of plant remains and welded angular conglomerate.

The series includes the hogback extending from Brown Dome, through Trig. P and the Dromedary, to Trig. A, another similar hogback passing through Trig. N, and all the beds to the southern boundary. These are included, because no higher fauna was found; but vertical beds, conglomerates, and carbonaceous beds near the southern boundary indicate that more formations are present.

The beds included dip south for more than a mile along Lochindorb Road at 45°, and are 3,500 ft. thick.

Among the fossils identified by Dr. Marwick are: *Pleuromya* sp.; *Inoceramus* cf. *galoi.*; *Mytilus* sp.; *Pseudomonotis* cf. *echinata* group; *Modiolus* sp.; *Tancredia* sp. According to Trechmann these fossils indicate the Bathonian-Oxfordian part of the Lower Oolite. These beds are called Putataka Series after Cox and McKay's usage in the Hokonui Hills.

Kaitangata Series.—The Kaitangata Series of this report includes the greywacke conglomerates and coal-measures at Kaitangata and their equivalents. The base is exposed in several places as a coarse subangular conglomerate, resting unconformably on a red weathered surface of schist. At Kaitangata the boulders and pebbles are mostly greywacke and sandstone with rare chert, quartz, and conglomerate. They average about 2 in. and rarely are 1 ft. through, and are enclosed in a scant matrix, so that the pebbles rest on one another. The fine material forms some thin beds less than 1 ft. thick. The beds vary sharply laterally, and contain irregular fragments and thin streaks of coal; and where the fine beds are thick the coal is thick. Irregular lenses and pockets of gravel have been deposited side by side with different attitudes, current bedded and irregular, and on weathering the conglomerate and current-bedded sand forms rude spheroids 12 ft. through.

The greywacke boulders predominate at Molyneux mouth; in other places the boulders are schist. In many places the conglomerate is bright red, in some places blue. It is evidently the same bed as at Bluespur. In the Taieri Gorge this formation is estimated as 3,000 ft. thick. As the Kaitangata beds are conglomerates of greywacke and schist resting on greywacke and schist, no one has ever doubted the big unconformity below them. The youngest beds of the undermass are the beds that at Kawhia contain ammonites indicative of the Oolite, Tithonian, or later. Evidently after that time the Hokonui sedimentation was stopped by folding, elevation, erosion, and depression, and then the Kaitangata conglomerate formed of fragments from the under-beds was laid down upon them. The conglomerate has no fauna; but it appears in the same place in the sequence as similar conglomerate at Shag Point, Waitaki Valley, Malvern Hills, Pakawau, Hawk's Crag, and Paparoa, which have all the same facies. Certainly it is not Pleistocene, as thought by Park, or Eocene, as described by Marshall, but is older than the upper Cretaceous.

The conglomerate at Kaitangata forms an asymmetrical anticline with a steep faulted west limb and a long gentle east limb corresponding to the surface.

Quartz Conglomerate.—Above the Kaitangata conglomerate lie thick deposits of quartz conglomerate that are difficult to subdivide and to correlate from place to place. At one place, Brighton, there is a belemnite fauna, at two places, Measly Beach and Boulder Hill, a rich Upper Cretaceous molluscan fauna, and loose blocks found in the Castle Hill shaft in 1892 have another fauna. There is also the "black bituminous limestone of Tokomairiro," reported in the Catalogue of the Colonial Museum, 1870, and never since observed, although, as Hutton said in 1875, he "made many inquiries about it." It is lithologically similar to the Castle Hill shaft rock, or, as Hector stated in 1892, "The material from the Castle Hill shaft also proves to be identical with the black limestone of Tokomairiro."

The Brighton fossiliferous beds are taken as the type of the Brighton Series, the Measly Beach fossiliferous beds are taken as the type of the Wangaloa Series, the Castle Hill shaft beds and the black limestone of Tokomairiro were not found, and are left out of the classification. This leaves the unfossiliferous underlying quartz conglomerate in a separate series, here called the Taratu Series.