

The surface of Mahia Peninsula shows a series of wave-cut terraces or benches ranging from a few feet above sea-level to 600 ft. The top of the peninsula, roughly 1,200 ft. to 1,300 ft. in height, also appears to be a wave-planed surface. The very gentle slopes of the various benches may be almost wholly original, in which case there has been practically uniform uplift, or may be due to tilting during uplift. The benches end seaward in almost vertical cliffs, 260 ft. in height or more. At the base of the cliffs is a continuous rock bench, bare at low tide, which in favourable situations extends a quarter of a mile seaward.

GENERAL GEOLOGY.

The subdivision is covered with Upper Tertiary marine sandstones and mudstones 20,000 ft. thick, with three small areas of Cretaceous rocks exposed through them. The beds found are shown in the following table :—

Series or Beds.	Nature.	Thickness.	Approximate Age or Stage.
	Fluviatile and beach deposits; dunes; sand and shingle of raised beaches, &c. (<i>Unconformity.</i>)	..	Pleistocene and Recent.
Petane beds ..	Massive mudstone	1,000 ft.	Nukumaruian (Pliocene).
Ormond beds ..	Limestone; conglomerate (<i>Erosion interval.</i>)	200 ft.	Waitotaran (Lower Pliocene).
Otunua beds ..	Massive mudstone with large concretions ..	4,000 ft.	} “Taranakian” (Upper Miocene).
Mapiri beds ..	Thick tuffaceous sandstone; mudstone ..	5,000 ft.	
Morere beds ..	Mudstone; sandstone	700 ft.	
Tutamoe Series	Mudstone; sandstone with concretions; conglomerate (<i>Erosion interval.</i>)	7,000 ft.	Awamoan (Miocene).
Ihungia Series..	Mudstone; sandstone with concretions .. (<i>Unconformity.</i>)	3,500 ft.	Hutchinsonian (Miocene).
Mangatu Series	Argillaceous limestone; sandstone; mudstone ..	1,500 ft.	Waiparan (Cretaceous).

Mangatu Series.—The east coast of Mahia Peninsula at four to five miles south of Table Cape and at one to two miles from the south end is formed of light-coloured mudstone, argillaceous limestone, and green-sandstone moved, slickensided, shattered, and brecciated. Similar rocks, not so broken, occupy the Kopuawhara Valley for a mile in the north of Mahanga Survey District, and there in the gas and brine springs three-quarters of a mile to the north and half a mile to the south of the Cretaceous area occur pieces of similar rocks and fragments of *Inoceramus* up to 2 in. long by $\frac{1}{2}$ in. thick. The only other fossil seen was the “Amuri fucoid.” The Cretaceous beds appear to be 1,500 ft. thick, and cover altogether less than two square miles. Their presence, however, indicates that they probably underlie the Tertiary rocks round about. Associated with them at all outcrops are gas and brine springs; and in the southern outcrop on Mahia Peninsula the rocks smell of oil.

Ihungia Series.—As the lowest Tertiary bed with recognizable fossils is a conglomerate containing the same fossils as the conglomerate at the base of the Tutamoe Series in Muddy Creek, Tutamoe Survey District, the beds below are regarded as belonging to the Ihungia Series. They, are, however, quite different from the Ihungia rocks of the type locality; they contain no igneous conglomerate and no massive mudstone, but consist of coarse concretionary sandstone and thin layers of mudstone darkened with carbonaceous films. Much of the material is comminuted shell, and many of the mudstone layers are eroded to form lenses of edgewise conglomerate. The sandstone beds are up to 20 ft. thick and contain numerous concretions up to 6 ft. long, in many places forming the greater part of the bed. Though the base of the series was not seen, the beds observed are 3,500 ft. thick. They are exposed on the coast of Paritu Survey District for two miles in the core of the anticline between the two outcrops of Tutamoe conglomerate, and extend south-westward along the fold. These rocks cannot be lithologically distinguished from the overlying strata, and fossils have not been found in them; but they were eroded and yielded pebbles to the overlying conglomerate, and so evidently belong to an older set of beds.

Tutamoe Series.—Overlying the conglomerate with the Tutamoe fossils is a set of thick beds of coarse concretionary sandstone with thin intervening beds of mudstone and rare bands of conglomerate, altogether 7,000 ft. thick. The rocks cannot be distinguished from those below except by their position above the conglomerate; and the several bands of conglomerate are alike both in the pebbles and in the fossils. The sandstone beds are commonly 6 ft. thick, and may be 30 ft. thick; the mudstone beds are generally less than 1 ft. thick. In many places the sandstone is marked with worm or gastropod trails, and the mudstone is streaked with carbonaceous films. The beds of conglomerate are usually less than 6 ft. thick, and contain chiefly well-worn pebbles of greywacke less than 1 in. long, with many broken shells, set in a mudstone matrix. Rarely greywacke pebbles 6 in. in diameter and pebbles of white mudstone 4 in. in diameter occur. Generally the upper part of the conglomerate is coarser, and consists not of fine greywacke pebbles but of 6 in. pebbles of dark mudstone and sandstone from the underlying beds. In the conglomerate on the east side of Onepoto Bay, Mahanga Survey District, two exceptionally big boulders of light mudstone are 6 ft. long and 3 ft. wide.

Morere Beds.—The sandstone beds of the Tutamoe Series become more argillaceous towards the top, and grade up into massive mudstone, which crops out typically west of Morere, in Nuhaka North Survey District, and on the east of Paritu Survey District, two to three miles south of Mapiri Point, where it is 600 ft. thick. The same bed can be followed inland from the coast, curving round the north of the Morere anticline to the Te Arai River and into the head of the Mangapoike. On the south side the same bed appears in the north-west of Mahia Peninsula, where it is much lighter-coloured. It also forms part of the north and east coasts of Mahia, the south part of Mahia, and apparently Portland Island as well. In this mudstone occurs a 6 in. to 1 ft. bed of dark crystal tuff, and in the upper part it grades into alternating thin beds of sandstone and mudstone 100 ft. thick.