

2. RODNEY SUBDIVISION.

(By H. T. FERRAR.)

Introduction.

The geological examination of the remaining portions of Rodney Subdivision, as tentatively defined in last year's annual report, was continued during the past field season. Field-work was commenced on the 3rd November, 1924, and ceased on the 17th April, 1925, during which period the following survey districts were surveyed: Kawau, Waioneke, Kaipara, Waiwera, Tiritiri, and portions of Tauhoa, Mahurangi, Kumeu, and Waitemata. These cover a block of country which extends from coast to coast across the North Auckland Peninsula, and includes the small towns of Helensville and Warkworth, as well as a number of growing villages. The country surveyed is 440 square miles in area, of which 28 square miles lie to the south of the subdivision. Geological assistance was rendered by Mr. F. J. Turner, B.Sc., for three and a half months, and Mr. D. A. Grant, F.R.G.S., who has been a member of the North Auckland field-party for five out of six seasons, assisted with topographical work.

Physiography.

The district surveyed is part of a deeply dissected land which has been partly submerged, so that the sea finds its way far inland up numerous drowned valleys. Insilting of these valleys and a recent small elevation counteract to some extent the encroachments of the sea. From the highest hills, few of which are more than 1,000 ft. high, the land falls gradually to heights of 500 ft. or less, and the landscape is in general of low relief.

The drainage of the district is effected by streams flowing east and west from a meridional divide which is situated rather nearer to the east than to the west coast. The streams are deeply entrenched, especially where the land is comparatively high; but in places, as at Kaipara Flats, broad open reaches occur in the midst of the hill tracts. The stream-pattern is very intricate, a complex history being thereby indicated. The chief eastward-flowing streams are the Puhoi, Waiwera, Orewa, and Wade (Weiti), and those flowing westward into Kaipara Harbour are the Waiparera, Makarau, and Kaukapakapa.

The Kaipara South Head peninsula, on the west side of the district, forms a separate physiographic unit. Here a range of hills, 400 ft. to 500 ft. high, with drainage flowing eastward into Kaipara Harbour, extends north-westward subparallel to the open sea-coast. Between the coast and the hills there is a belt of drifting sand, 20 ft. to 50 ft. above sea-level, separated from the hills by a chain of swamps and shallow lakes. In places the drift sand is being blown on to the hill-tract, and in consequence the watershed is migrating eastward. The mouths of those streams draining eastward are drowned, and are now occupied by extensive mangrove-flats.

General Geology.

The following provisional table gives a synopsis of the geological sequence in North Auckland, together with the approximate age of the several formations:—

Local Name.	Description of Strata.	Series or System.	Approximate Age.
..	Swamps, alluvium and drift-sand .. ..	..	Recent.
..	Scoria-cones and later basaltic lavas .. ..	..	Recent to Pleistocene.
..	Consolidated sand-dunes; gravel terraces .. ..	..	Pleistocene.
Kerikeri Series ..	Basalts and basaltic andesites .. ..	..	Pleistocene or Pliocene
Purua beds ..	Fresh-water leaf-beds, lignitic sandstones, tuffs .. ..	..	Pliocene.
Manukau breccias ..	Andesitic lavas, breccias, and tuffs (Wairakau Series)	..	Miocene.
Waitemata Series ..	Argillaceous sandstones with calcareous volcanic grits; fossiliferous sandstones and conglomerates (Cape Rodney Beds); tuffs and fossiliferous sandstone (Pakaurangi Beds) (Local unconformity.)	Oamaruan	Miocene.
Whangarei Formation	Crystalline limestone, glauconitic sandstone, coal, and conglomerates (Unconformity.)		
..	Rhyolites and dacites (Parahaki Series); ultra-basic intrusions ("serpentine")	..	Eocene (?).
Onerahi Formation ..	Argillaceous limestone, greensand in places, claystones and conglomerates (Unconformity.)	Waiparan	Cretaceous
Otamatea beds ..	Silicified claystones, grey sandstone with cone-in-cone limestone, ammonites, and <i>Inoceramus</i> (Unconformity.)		
Waipapa Series ..	Greywackes, argillites, and minor limestones	Hokanuian (? in part only)	Trias-Jura (?).

Previous geological work in the area under review was first carried out by F. von Hochstetter in 1859. Official examinations of portions of the area have been made by J. Hector, S. H. Cox, A. McKay, J. Park, P. G. Morgan, and J. Henderson. Private workers in this field include E. K. Mulgan and J. A. Bartrum, the latter of whom recently mapped portions of Kaipara and Waiwera survey districts.