

A NOTE ON THE GEOLOGY OF THE COASTLINE WEST OF WHANGAPARAPARA, GREAT BARRIER ISLAND

by B.W. Hayward*

SUMMARY

The geology of 10 km of coastline west of Whangaparapara is presented in the form of two maps, stratigraphic columns and a brief note. The east to north-east dipping sequence of stratified breccias and andesite flows, cut by one intrusive body, is all included within the Beesons Island Volcanics (upper Miocene – lower Pliocene).

INTRODUCTION

A 10 km stretch of rugged coastline west of Whangaparapara on Great Barrier Island (see Hayward (1973) for location) was mapped during the A.U.F.C. Scientific Camp in August, 1972.

Although the area was part of that mapped by Hayter (1954) he never actually stepped foot on any of the coastline here described. Thompson (1960), based on Hayter's work, included the sequence described here within the Beesons Island Volcanics. Ramsay (1971) mapped an area immediately east of this section and records a very similar sequence of Beesons Island Volcanics around the coastline from Whangaparapara to Okupu.

STRUCTURE AND STRATIGRAPHY

The structure of the coastline mapped is shown in Fig. 1 while lithologies of the eastern half of the coastline are recorded in Fig. 2 and in stratigraphic column form in Fig. 3.

The eastern portion of the sequence has an average dip of 30° to the east or north-east; the north-west portion dips to the north or north-east at an average of 30° which decreases away from Whangaparapara. These attitudes are consistent with the average 45° easterly dip recorded by Ramsay (1971) east of this.

The north-west portion of the mapped area consists of a bedded sequence of tuffaceous pebble to boulder breccias, angular pebble to boulder rubbly breccias and laminated granule breccias, volcanic litharenites and occasional lithlutites. Andesitic lava flows are absent.

The eastern portion of the area was mapped in more detail, the stratigraphically lowest horizon being exposed at III (Fig. 2). The sequences exposed both north-west (III to IV) and east (III to I) of here are presented in

* Geology Department, University of Auckland.

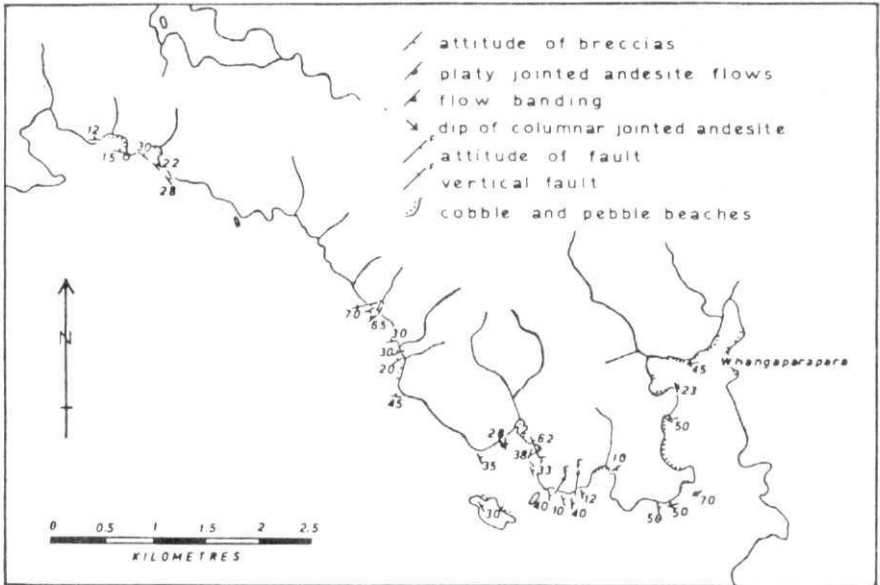


Fig. 1. Map of geological structure of an area west of Whangaparapara.

Fig. 3. Correlation of lithologies between these two columns proved impossible, and so supports the idea of a lensoidal or wedging nature, typical of deposits of this type.

The sequence in both columns is one of massive laminated tuffaceous granule to boulder breccias, subrounded to subangular rubbly breccias, monolithologic angular rubbly breccias that are inferred to be autobrecciated lava flows, and also interstratified lava flows ranging from 1 to 35 metres in thickness. The north-west column has a larger percentage of laminated breccias and fewer flows than that to the east. The percentage of andesite flows in the eastern column increases upwards through the sequence with the uppermost 100 metres consisting almost solely of columnar jointed flows.

At IV in the north-west section a flow-banded hypersthene andesite body, 35 metres across and of unknown shape, intrudes the sequence. Thin section study shows it to be very similar to the Kai-iti Porphyrite of Skinner (1962) and also to an intrusive body mapped by Ramsay (1971) some 2 km north-east of Whangaparapara.

Several small faults were mapped (Fig. 1) but none with a large throw was recognised. Assuming an absence of major faults, the sequence in this area has a maximum thickness of 700 metres.

Deposition of this sequence is inferred to have been marginally subaqueous with some units water-deposited and others subaerial. Volcanic-type effusion of alloclastically brecciated breccia flows, that often became lahars as they flowed down the volcano slopes, is inferred to have contributed the major

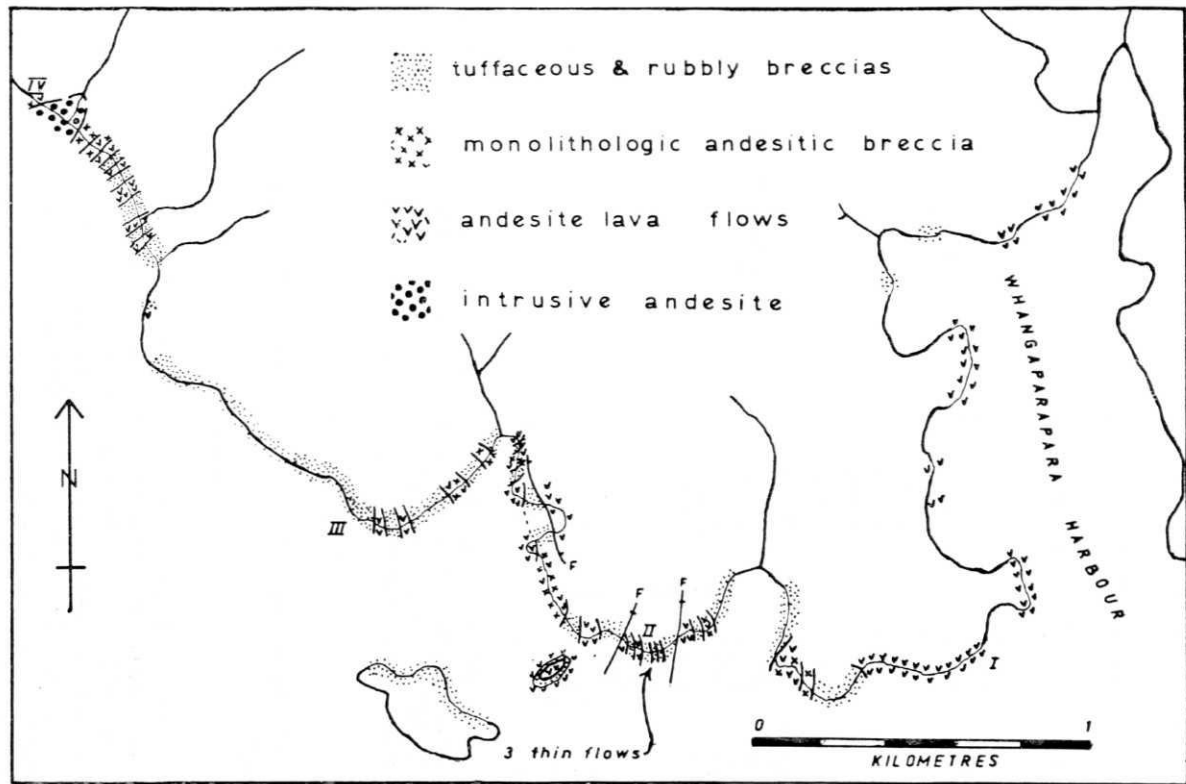


Fig. 2. Detailed lithological map of eastern portion of area mapped west of Whangaparapara.

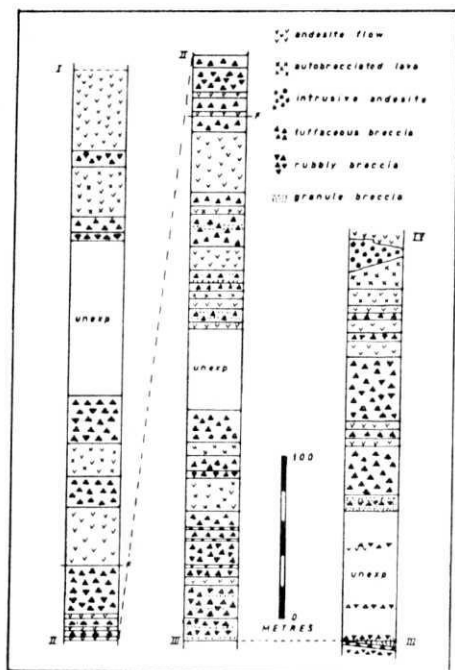


Fig. 3: Stratigraphic columns of eastern portion of area mapped west of Whangaparapara.

proportion of this sequence. Extrusion of andesite flows, that at times became autoclastically brecciated, was also a significant source of material.

It is hoped that this small study will add a little to what is still just a patchy picture of the detailed geology of Great Barrier Island.

ACKNOWLEDGEMENT

I should like to thank Mr J.A. Grant-Mackie for critically reading this manuscript.

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