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Late Quaternary tephtras on the Coromandel Peninsula, North Island, New Zealand (Note)

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Abstract Late Quaternary tephtras, including Rotoehu Ash and Whangamata Ash, are described from sites on the east coast of the Coromandel Peninsula, and from 1 site on Great Barrier Island. Several named tephtras from further south are conveniently grouped in this area into 2 mapping units: Holocene tephtras, and late Pleistocene tephtras. Positive identification of these tephtras is important for further work on the geomorphology, pedology, coastal studies, and general Quaternary history of the area.

Keywords Quaternary; tephtras; Coromandel Peninsula; Rotoehu Ash; Whangamata Ash

INTRODUCTION

On the east coast of the North Island, New Zealand, late Quaternary tephtras have been recognised as far north as Waihi (Vucetich & Pullar 1969) and Hot Water Beach (Pullar et al. 1977) and between Whiritoa and Whangamata (Birrell et al. 1977). At their Waihi site Vucetich & Pullar (1969, p. 794, site g) noted the presence of Rotoehu Ash at the base, Mangaone Lapilli, loess, and minor Whangamata Ash. Further north, Pullar et al. (1977) found airfall Taupo Pumice and Kaharoa Ash. In this note the Waihi site is used as a reference, and the various units present at that site are traced northwards along the eastern side of the Coromandel Peninsula and onto Great Barrier Island. Figure 1 shows locations of the sites and the correlation section, while Fig. 2 shows the correlation section. Fieldwork was done in 1975 in conjunction with coastal studies carried out by Dr T. R. Healy, University of Waikato.

DESCRIPTION AND CORRELATION

Rotoehu Ash (re)

Rotoehu Ash was named by Vucetich & Pullar (1969). It has a radiocarbon age (NZ1126) of $41\,700 \pm 3500$ years B.P. (Pullar et al. 1973). At Waihi (site 1, Fig. 1, 2) it occurs at a depth of 135-186 cm, and rests on heavy grey clay. It is distinctly shower bedded, with 5 beds ranging from 3 to 18 cm in thickness. It has a predominantly sandy texture and is yellow to greyish yellow. Further north it is not always distinctly bedded, but its sandy texture and yellowish colour make it easily recognisable. In some places, for example, north of Kennedy Bay, it consists of sandy "cores" in a fine sandy matrix. In this expression it has similar characteristics to those it exhibits on the west coast of the North Island, near Kawhia and Taharoa (Pain 1975). There does not appear to be any consistent variation in the unit that can be correlated with distance from the source.

Rotoehu Ash rests on various materials. It has been found overlying older tephtras, on alluvial and colluvial materials, and on weathered volcanics. It also overlies coastal deposits of either eolian or subaqueous origin. Its most common occurrence in such situations is overlying dune sands or beach ridge materials, usually with a paleosol formed in the sand. The stratigraphic relationship between Rotoehu Ash and the underlying dune sand on the Coromandel Peninsula, especially at Otama (site 13, Fig. 2) is remarkably similar to that noted by Pain (1976) for the Kawhia and Taharoa areas.

Undifferentiated late Pleistocene tephtras (LP)

A unit consisting of reddish brown, firm to friable ash is interpreted to be composed of some of the late Pleistocene tephtras described by Vucetich & Pullar (1969). Vucetich & Pullar note the possible occurrence of Mangaone Lapilli* at Waihi. This seems likely in view of the proven presence of easily recognisable Mangaone Lapilli on the western side of the Kaimai Ranges, in Piako County (A. D. Wilson pers. comm.). Other tephtras described by Vucetich & Pullar (1969) for areas south of Waihi have probably contributed to this unit of late Pleistocene tephtras, but they are not identified here.

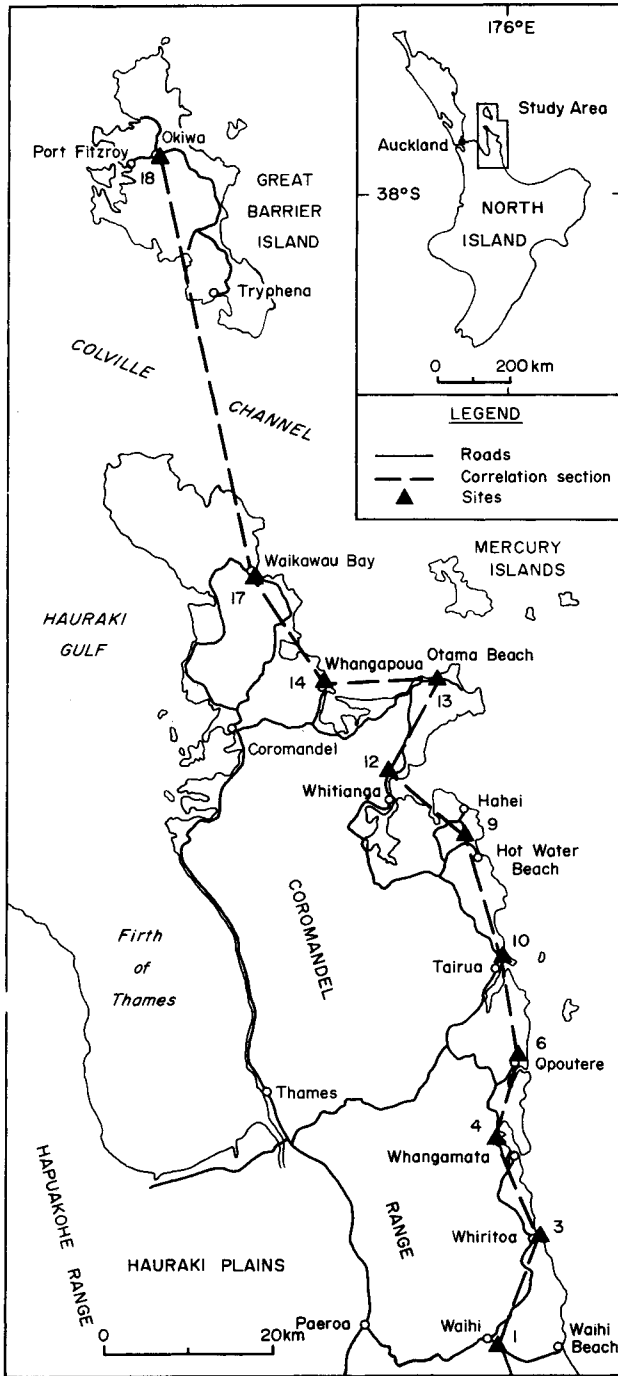


Fig. 1 Coromandel Peninsula and Great Barrier Island, showing locations of sites and the correlation section.

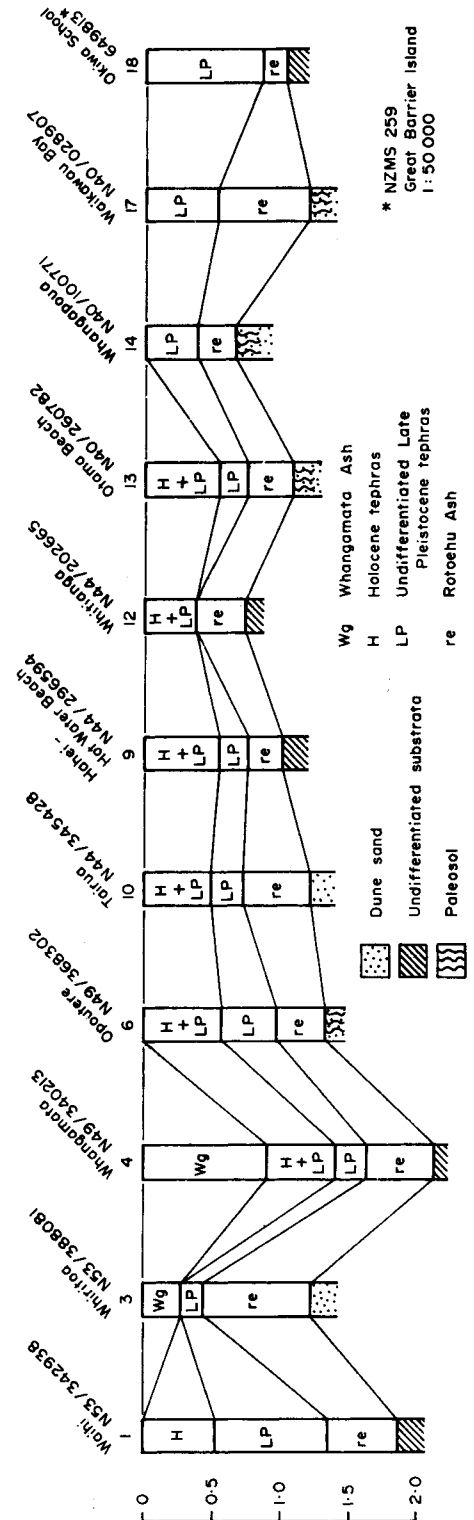


Fig. 2 Correlation section for tephra from Waihi to Great Barrier Island. Grid references for all except site 18 are based on the national thousand-yard grid of the 1:63 360 topographical map series NZMS 1. The grid reference for site 18 is based on the thousand-metre grid of the 1:50 000 topographical map series NZMS 259.

* NZMS 259
Great Barrier Island
1:50 000

Wg Whangamata Ash
H Holocene tephra
LP Undifferentiated Late Pleistocene tephra
re Rotoehu Ash

Dune sand
Undifferentiated substrata
Paleosol

Holocene tephtras (H)

At Waihi (site 1, Fig. 2) a unit of Holocene tephtras is differentiated on the basis of its light reddish brown to yellowish brown colour and its friable consistence. Vucetich & Pullar (1969) note the presence of Holocene tephtras at Waihi, and the unit of friable ash material is so interpreted here. However, further north, the unit becomes more like the underlying late Pleistocene tephtra unit, and a separate Holocene tephtra unit cannot be recognised. Instead, a multiple unit which combines the characteristics of the late Pleistocene and Holocene tephtras is recognised (sites 4, 6, 9, 10, 12, and 13, Fig. 2). In the northern part of the peninsula and on Great Barrier Island (sites 14, 17, and 18, Fig. 2) the Holocene tephtras appear to have lensed out altogether.

Whangamata Ash (wg)

This rhyolitic tephtra has a local distribution around Whangamata and Whiritoa (Fig. 2). It occurs at the surface and consists of medium lapilli at the base grading up to fine lapilli and ash. It was first named by Taylor (1953) and is discussed by McCraw & Whitton (1971). The latter authors show that Whangamata Ash and breccias on Mayor Island are comagmatic, but they could not give an indication of the age of the ash. Because this tephtra is potentially a valuable marker bed in the local area, more work is needed on its distribution and age. All that can be noted at present is that it is older than the innermost Holocene dunes at Whangamata*

DISCUSSION

The various tephtra units described in this note overlie a variety of land surfaces formed on different materials. They thus have a value as marker beds of known age in this part of New Zealand, just as tephtras in other parts of New Zealand have been shown to be of value in determining the ages of land surfaces. In the Coromandel Peninsula area, the

most promising use of tephtras is in the field of coastal studies. It should be possible to delimit subaerial coastal sediments of different ages, and draw paleocoastlines in the same way that Pullar & Selby (1971) did for the Rangitaiki Plains, near Whakatane.

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*EDITORIAL NOTE: Hogg & McCraw (in press) have a manuscript on the Whangamata Ash in the process of publication. It identifies the dated Tuhua Tephtra Formation of Lowe et al. (1980) as part of Whangamata Ash. Buck et al. (this issue) includes these references, and another radiocarbon date on the Tuhua Tephtra Formation and its eruption from Mayor Island—Ed.