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To cite this article: C. F. Pain (1979) Radiocarbon ages from dune sands near Aotea and Kawhia Harbours, North Island, New Zealand (Note), New Zealand Journal of Geology and Geophysics, 22:2, 291-292, DOI: [10.1080/00288306.1979.10424229](https://doi.org/10.1080/00288306.1979.10424229)

To link to this article: <http://dx.doi.org/10.1080/00288306.1979.10424229>



Published online: 09 Feb 2012.



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Radiocarbon ages from dune sands near Aotea and Kawhia Harbours, North Island, New Zealand (Note)

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ABSTRACT

Recently obtained radiocarbon dates suggest that Maori occupation of coastal areas near Aotea and Kawhia Harbours initiated eolian erosion of previously stable dune systems during the last 600-800 years. This erosion led to the formation of the most recent sand dunes.

Details of Quaternary dune sands and associated deposits were presented in Pain (1976). In that paper the Mitiwai Sands Formation of Kear (1965) was subdivided into two members, the older Paparua Sands Member and the younger Nukumiti Sands Member. Both members are composed of eolian sands. This note reports radiocarbon dates, recently available, that bear on the age of these two members, and also on the age of Maori occupation in the area.

The Paparua Sands Member, a titanomagnetite-rich loose sand with rare dune bedding, rests on older dune sands that have a capping of Late Quaternary tephras. The member is capped by weakly developed sandy Parangi soils (Pain in press), and is buried over part of its distribution by the Nukumiti Sands Member. Parangi soils, thus, have a buried and in some cases re-exhumed counterpart.

The Nukumiti Sands Member consists of loose eolian sand, largely in the form of active transverse dunes with occasional barchans. The active dunes are in places

currently encroaching on dunes of the Paparua Sands Member and also onto older surfaces. In some areas the Nukumiti dunes have stabilised and have a very thin soil developed on them. This soil, the Taharua sand of Pain (in press), is little more than a thin layer of organic-stained sand over loose unaltered sand.

Five radiocarbon ages have become available since the original study was published. These ages and their locations are presented in Table 1. WK 35, with an age of 75 ± 120 years, is rejected on the basis that it is almost certainly contaminated with younger materials, either modern rootlets or modern organic acids. The other four dates all overlap at two standard deviations. However, when only one standard deviation is included, WK 31 stands out as being older than the other three.

In Pain (1976) it was noted that the Paparua dunes had become stable and had developed a soil cover before the arrival of the first Maori settlers; about 800 years ago (R. J. S. Cassels pers. comm.). The dates reported here support such an interpretation. Further, they sug-

TABLE 1—Radiocarbon ages from dune sands near Aotea and Kawhia Harbours.

Lab No*	Material Dated	Stratigraphic Location	Location and Grid Reference†	Radiocarbon Age‡ (years B.P.)
WK 31	charcoal	top of recently exposed Parangi soil, with shells and cooking stones	top of cliff 0.5 km south of Aotea Harbour entrance N73/324184	660 ± 120
WK 32	charcoal	topsoil of recently buried Parangi soil	Taharua, 1 km east of Lake Rotorua. N73/249981	350 ± 120
WK 33	charcoal	midden deposit overlying a Parangi soil profile	Taharua, beside fence at northern end of dune field. N73/235046	380 ± 110
WK 34	charcoal, wood & bark fragments	70 cm below surface of Nukumiti dune sand	Kawhia, sand quarry on road to ocean beach. N73/241128	520 ± 100
WK 35	organic-rich clay	85 cm below surface of Paparua dune sand	Aotea Beach Road. N73/347181	75 ± 120

*Professor A. T. Wilson, Chemistry Department, University of Waikato, Hamilton, New Zealand.

†Grid reference based on the national thousand-yard grid of the 1 : 63 360 topographical map series (NZMS 1), sheet N73, 1953 edn.

‡Based on Libby half life.

gest an increase, or a renewal, of dune instability about 300–400 years ago. There was, therefore, an early stage of instability during which the Paparoa dunes were eroded and the reworked sand built into Nukumiti dunes. Later instability continued the erosion of the Paparoa dunes and increased the area of Nukumiti dunes. At present the older and younger Nukumiti dunes cannot be separated, except on the basis of the dates reported here.

The most likely interpretation, on the presently available evidence, is that the first Maori settlers in the Kawhia and Taharoa areas chose the areas of Parangi soils for occupation and food supplies. It is highly likely that bracken fern (*Pteridium esculentum*) was abundant and provided an important food source. In addition, the Parangi soils would have been much easier to work than soils on the surrounding hills. This

occupation and land use, apparently intensifying with time, is sufficient to explain the initiation of erosion and dune building in the area during the last 600–800 years.

REFERENCES

- KEAR, D. 1965: Geology of New Zealand's ironsand resources. Paper 219 in: *8th Commonwealth Mining and Metallurgical Congress, Australia and New Zealand, 1965. Publication 7.*
- PAIN, C. F. 1976: Late Quaternary dune sands and associated deposits near Aotea and Kawhia Harbours, North Island, New Zealand. *N.Z. Journal of Geology and Geophysics* 19: 153–77.
- (in press): Soils of the Taharoa–Kawhia coastal area, North Island, New Zealand. *N.Z. Soil Survey Report.*