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A Polynesian Adze from Whatarangi, New Zealand

**Foss Leach, Research Associate, Te Papa Tongarewa
Peter Sheppard, Auckland University
Rob Parker, Auckland University**

The Great Wall of Whatarangi

In the early 1970s an interesting adze was found on the surface of a place in Palliser Bay, known locally as the Great Wall of Whatarangi, by Bob Buckley, a local farmer and cray fisherman. The site is a long beach ridge, much modified by pre-European Maori with stone walls leading off it at right angles and kumara garden areas along its length. It was first reported by Adkin in 1955, and recorded in the NZAA site recording scheme in 1969 as N168-9/16 (now S28/43) during the Palliser Bay archaeological expedition (Leach and Leach 1979). “It lies between the mouth of Woolshed Creek and Whatarangi Stream. Adkin (1955:460) described it as ‘unusually massive ... , built of large stones and apparently a solitary structure ... trending parallel to the shore’” (Leach, H.M. 1976: 18-19). At the northern end of the Great Wall an area of extensive midden appears, buried under alluvium, and constantly being eroded by tidal waves. Helen Leach noted that “artefacts such as a small polished untanged rectangular-sectioned adze, a one-piece fishhook tab of moa bone, and obsidian and chert flakes, are frequently recovered” (Leach, H.M. 1976: 19). This area of exposed and eroding midden is indicated on the site map in the Palliser Bay Bulletin (Leach, H.M. 1979: 139). The adze found by Bob Buckley was about 30m inland of this midden area. No further information is available about the context of the adze, which can only be considered as a find spot in the general vicinity of known archaeological sites which date from the time of first settlement of New Zealand through to the period of first Europeans. The Washpool site, for example, is 2,200m due south of the find spot (Leach, B.F. 1979: 77). The find spot is also 360m south of the present-day experimental kumara garden, a project in its 16th year of research (Burtenshaw *et al.* 2003).

Description of the Adze

The maximum dimensions of the adze are 218 mm long, 71 mm wide, and 51mm thick (Figure 1). Adzes of this exact form are unknown in New Zealand archaeological sites, but are common in the Lower Cook islands, Society Islands, and the Tuamotu and Austral islands (Duff, 1959: 135).

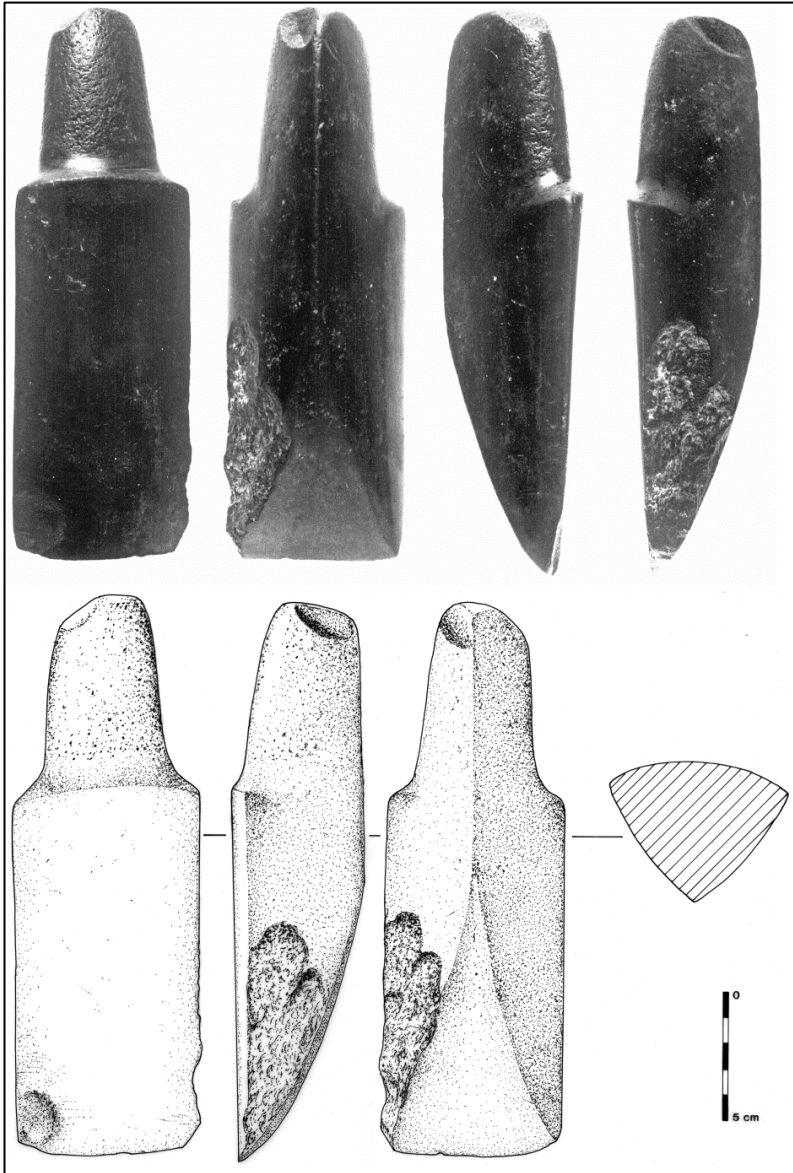


Figure 1. The Polynesian adze from Whatarangi, Palliser Bay (drawing by Joan Lawrence).

In Duff's classification of Eastern Polynesia, it is designated as Type 3A. Typologically similar adzes are certainly present in New Zealand (see Duff, 1956: 171, Figure 38 central adze), but they are not as heavy and thick as those from tropical Polynesia. Because this adze was so unusual in a New Zealand context it was thought desirable to have the lithology examined to see if it could have been made in New Zealand, and if not, whether the stone's origin could be identified. Bob Buckley gave permission for a small piece to be removed from it for examination, so long as the damage could be covered over and made to look like the original condition. The adze was cored using a diamond coring bit to remove sufficient sample (c. 8g) to prepare a thin section and samples for analysis by Wavelength dispersive X-Ray-Fluorescence (XRF). The cored adze was then repaired with epoxy filler tinted to look like the original stone.

Petrographic Analysis

No phenocrysts were seen in the thin-section and the adze core may be described as an aphyric basaltic rock. The thin-section is noted for a matrix dominated by plagioclase and clinopyroxene, with some suggestion of minor preferred orientation by these crystals. The adze core is very fine grained (0.05-0.25 mm). Plagioclase shows well formed elongated micro-laths displaying good multiple twinning, and clinopyroxene also exhibits well formed elongated micro-laths that are pale pinky-brown in colour with generally oblique extinction. Minor amounts of olivine form equant and elongate micro-crystals. Ubiquitous opaque minerals are present as cubic to blocky micro-crystals.

The matrix contains well developed patches of poorly crystallised feldspathic material (colourless, low birefringence, twinning absent) which appears to be a late forming phase infilling between other crystals. It is associated with irregular dark to opaque 'rods' which penetrate through the feldspathic material. XRD scans would be needed to help identify this phase, and in particular to test for the presence of feldspathoids such as nepheline. Secondary patches of calcite are present and the matrix contains some orange-brown patches (altered olivine ?). Vesicles form 5-10 % (?) of the thin-section.

The petrographic analysis is completely consistent with samples examined from the Cook Islands, and although it has no distinctive features it could well be from Central Polynesia. However, there is no petrographic basis for distinguishing the sample from a possible source in New Zealand.

XRF Analysis

The geochemistry of the Whatarangi adze is quite unlike any samples of adze material so far analysed from New Zealand, either from quarries or other adzes. Unfortunately, however, the present geochemical database is far from comprehensive for New Zealand; so it is not possible to say that the geochemistry could not be replicated by New Zealand basaltic rock.

Table 1: XRF Element Results

<i>Major Elements g/mg</i>				
Oxide	SP22-3	TP1	T6	T11
SiO ₂	45.34	44.29	42.94	44.37
TiO ₂	3.63	4.08	3.58	3.64
Al ₂ O ₃	15.16	14.50	15.28	15.76
Fe ₂ O ₃	13.15	14.14	13.88	13.08
MnO	0.17	0.19	0.19	0.19
MgO	4.65	5.17	5.03	4.61
CaO	10.06	10.64	10.29	9.41
Na ₂ O	3.21	3.29	3.53	3.63
K ₂ O	2.19	2.18	2.36	2.01
P ₂ O ₅	0.74	0.77	0.79	0.75
Total	98.31	99.53	97.87	97.44
LOI	0.60	0.00	1.36	2.16
<i>Trace Elements ppm</i>				
Element	SP22-3	TP1	T6	T11
Ni	39.1	79.0	65.5	29.4
Cu	59.2	0.0	110.2	69.5
Zn	124.7	129.0	124.9	123.3
Zr	337.1	360.0	317.2	346.7
Nb	70.3	71.0	61.9	62.0
La	74.1	85.0	64.7	70.0
Ce	150.8	115.0	125.6	154.3
Pb	7.9	7.0	6.9	5.9
Th	7.5	7.0	7.1	5.5
Sc	17.7	19.0	11.7	16.4
V	328.3	351.0	332.1	343.2
Cr	4.4	67.0	20.0	1.0
Ga	26.5	0.0	25.3	23.6
Rb	49.6	45.0	71.2	60.3
Sr	993.2	1022.0	1040.0	798.3
Y	36.0	39.0	37.5	41.3
Ba	635.2	618.0	641.9	513.6
U	3.1	3.0	2.0	3.3

The present New Zealand data are confined to material from the Tahanga quarry, and visually similar rock from Great Barrier Island and the Waitakere Ranges near Auckland. Therefore the comparison of the XRF results for the Whatarangi adze is based on the database of samples of adzes and source material (quarry and geological) from Samoa and East Polynesia assembled by Parker and Sheppard (1997).

The major and minor element composition of the Whatarangi adze is given in Table 1, together with the most similar results extracted from the database of element results for other adze lithologies in New Zealand and the Pacific. Sample SP22-3 is from Pue, Rarotonga in the Cook islands; TP1 is the adze from Whatarangi; T6 and T11 are both from Papeno'o, Tahiti, in the Society islands. As can be seen, the major and minor elements are very similar across all four samples in the Table. In fact, it is even difficult to separate the results of Rarotonga from Tahiti.

Conclusion

It is most unfortunate that this adze was not found in a controlled excavation. Museums in New Zealand are replete with adzes with little or no provenance in the sense of cultural associations and datable context. However, the form of the adze is all but identical to large numbers of adzes from Central Polynesia, and there seems little doubt that this is an import from there. The petrographic and XRF results are consistent with this interpretation, but it has to be admitted that another origin cannot be ruled out.

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Leach - Adze

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