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DESCRIPTION OF A LITHIC ASSEMBLAGE FROM MOTUKOREA (BROWN'S ISLAND)

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INTRODUCTION

Motukorea (Brown's Island) is situated 2 km off the east coast of the Tamaki isthmus (Fig. 1). This 60 ha. island is distinguished by a cluster of small volcanic cones formed within the last 20,000 years (Searle 1981: 166-167). The highest of these rises 68 m above sea level. Associated with these cones is a fertile volcanic soil which mantles the island. The present-day vegetation cover consists of pasture with a few patches of scrub.

The fertile soil and strategic location of Motukorea must have presented an attraction for the first inhabitants of the Auckland region. Occupants of the island would have had the use of a rich garden soil and access to a range of marine resources. The location of Motukorea near the mouth of the Tamaki estuary may have also ensured control over movement of people and goods along the east coast of the Tamaki isthmus and between the isthmus and the islands of the Hauraki Gulf (Fig.1). The surface archaeological evidence on Motukorea testifies to intensive pre-European activity on the island. Much of this evidence is in an extremely good state of preservation and takes the form of pa, storage pits, stone structures and large areas of coastal midden (Rickard 1986). This combination of well-preserved features within a localised area is unique in the Auckland region and presents archaeologists with a microcosm of how the region's landscape must have looked before the arrival of Europeans.

Motukorea also possesses a wealth of stone artefactual material. This is attested by numerous surface scatters consisting of cores, preforms and large amounts of chipped stone debitage. Stone items from some of these scatters have been gathered by a number of people over the years and are now deposited with the Auckland Institute and Museum and the Department of Conservation, Auckland. These collections afford an opportunity to research the source from which the prehistoric inhabitants of Motukorea obtained their stone and the manner in which they utilised this material. With a view to investigating these questions I undertook a study of the collection lodged with the Department of Conservation (henceforth termed the Motukorea assemblage). This paper outlines the results of that study.

PROVENANCE OF THE STONE MATERIAL

The Motukorea assemblage consists of 285 items of stone ranging from microflakes to finished adzes. Many items are not provenanced to specific

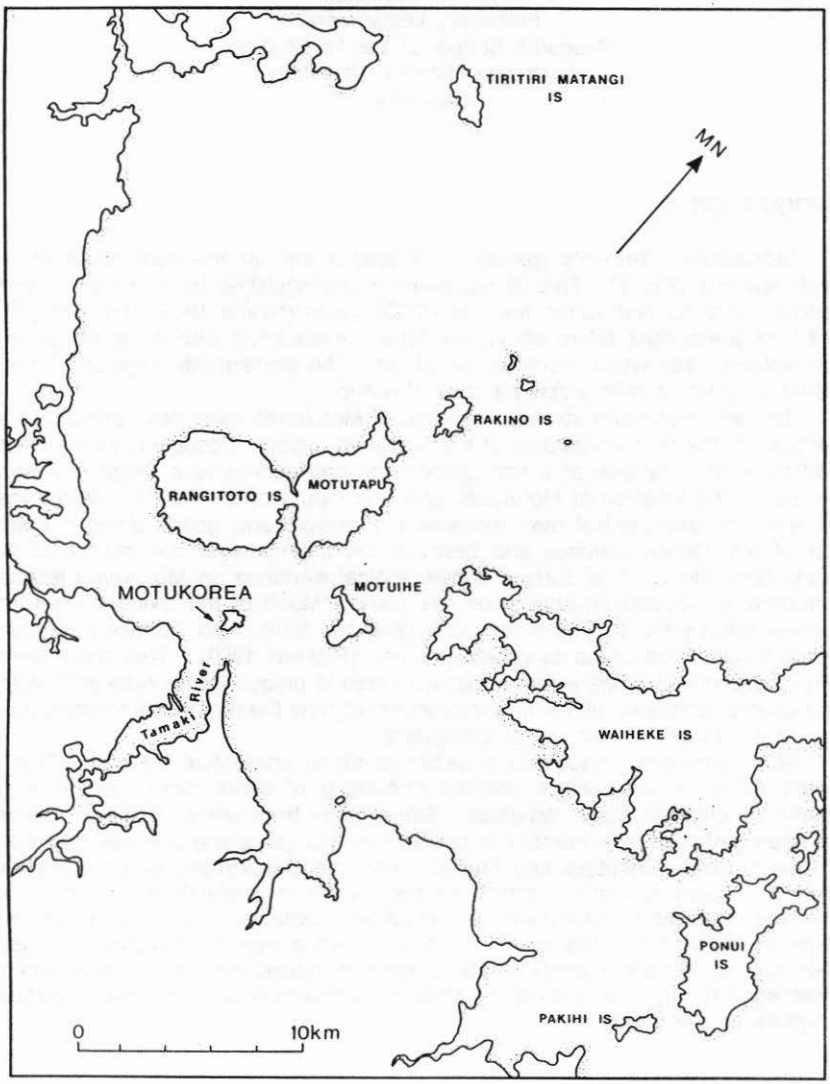

Fig. 1. Location of Motukorea.

archaeological sites. However, 109 items (38% of the entire assemblage) are recorded as having been collected from five sites (Fig. 2). Of these 109 items, 85 (or 78%) were recovered from site R11/565, 13 from R11/1097, 11 from R11/566, and one from each of R11/127 and R11/561 (Fig. 2). Rickard (1986) describes the first three sites as middens, while R11/127 is recorded as an area of stone structures and R11/561 as a low saddle possessing artificial terracing.

During a visit to Motukorea in mid 1987, I noted three other areas where concentrations of stone material were visible (Fig. 2). Two of these were middens (recorded as R11/129 and R11/1500) which had been disturbed by burrowing rabbits. (Rabbits are quite a problem on the island and present a major threat to intact archaeological material). The third locality was an area on the south-west coast where water-rolled flaked stone was visible scattered along the foreshore. Other areas almost certainly possess archaeological stone material. Rickard (1986: 28) states that 'almost all the middens recorded on the coast have stone flake material eroding out of them in large quantities'.

IDENTIFICATION AND SOURCING

A number of stone types are present in the assemblage. The non-obsidian artefacts were identified and characterised by K. Prickett using hand specimen analysis. Obsidian artefacts were characterised by myself on the basis of colour in transmitted light. Many New Zealand obsidians can be reasonably confidently sourced using this technique (Moore 1988). However, such visual techniques are often unreliable for other lithic materials. The characterisation of non-obsidian materials presented in this paper should therefore only be treated as tentative.

The results of the stone identification are set out in Table 1. It is clear that most (83.5%) of the artefacts are of 'greywacke' sandstone, which was possibly derived from two source areas in close proximity to Motukorea. The remainder of the assemblage consists of obsidian, chert, basalt and argillite. The presence of a translucent pale grey obsidian in the assemblage may indicate a Great Barrier source for this material, while a clear green obsidian probably originated on Mayor Island. Chert and some basalt may have been obtained from Coromandel Peninsula deposits, the latter from Tahanga quarry (Moore 1982). Argillite and some basalt was possibly obtained from the local Auckland/Hauraki Gulf region.

STONE ARTEFACT FORM

The stone items of the assemblage can be divided into five categories on the basis of function and morphology (Table 2). It is evident that the majority of items fall within the category of flakes and shatter. This category includes conchoidal flakes (items exhibiting a bulb of percussion and striking platform) and other less diagnostic items of chipped stone debitage.

In Figs. 3 and 4 flakes and shatter have been plotted by length and breadth to illustrate variation in shape and size range (flake breadth is taken as the measurement through the centre of the flake parallel to the striking platform, while length is the measurement perpendicular to this; for other items length is the

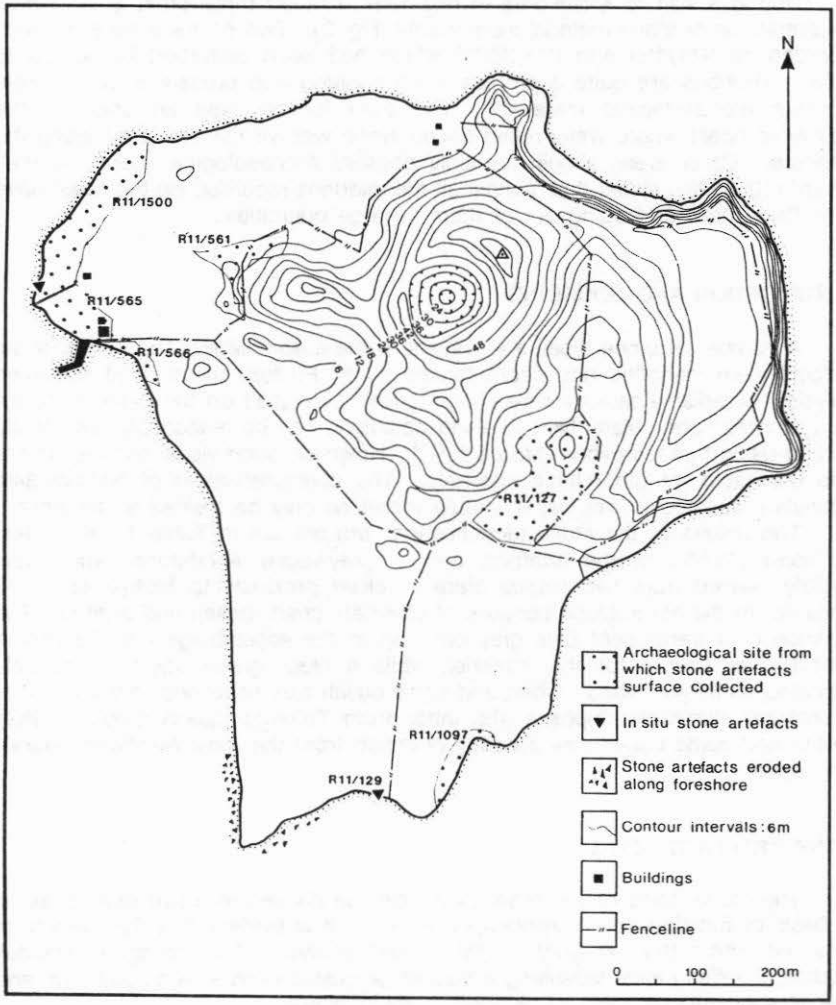

Fig. 2. Motukorea, showing sites mentioned in the text.

measurement along the long axis and breadth is taken as perpendicular to this).

TABLE 1. SOURCE OF MOTUKOREA LITHIC MATERIAL.

	Number of Items	Possible Source	Distance to Source*
Greywacke	238 (83.5%)	Motutapu Island, South Auckland	4 - 30 km
Obsidian	23 (8.0%)	Great Barrier Island, Mayor Island	80 - 150 km
Chert	16 (5.5%)	Coromandel Peninsula	60 km
Basalt	5 (2.0%)	Auckland, Coromandel Peninsula (Tahanga)	20 - 70 km
Argillite	3 (1.0%)	Motutapu Island, Waiheke Island	4 - 10 km

*Shortest distance

TABLE 2. ARTEFACT FORM: MOTUKOREA ASSEMBLAGE.

	Greywacke	Obsidian	Chert	Basalt	Argillite	Total
Flakes and shatter	231	23	15	5	2	276
Preforms	5	-	-	-	-	5
Adzes/chisels	-	-	-	-	1	1
Drillpoints	1	-	1	-	-	2
Hammerstones	1	-	-	-	-	1

Fig. 3 demonstrates that items of greywacke exhibit great variability in shape and size, with the presence of both very small items (less than 40 mm) and much larger pieces (greater than 100 mm).

Although the sample is small, flakes and shatter of the other represented stone types seem to exhibit a more restricted size range (Fig. 4). Obsidian pieces tend to fall in the smaller size category for the non-greywacke material. Chert has a wider size distribution than the obsidian. The few items of basalt and argillite generally occur at the upper end of the size range, probably owing to their occurrence as the byproduct of adze manufacture (see below).

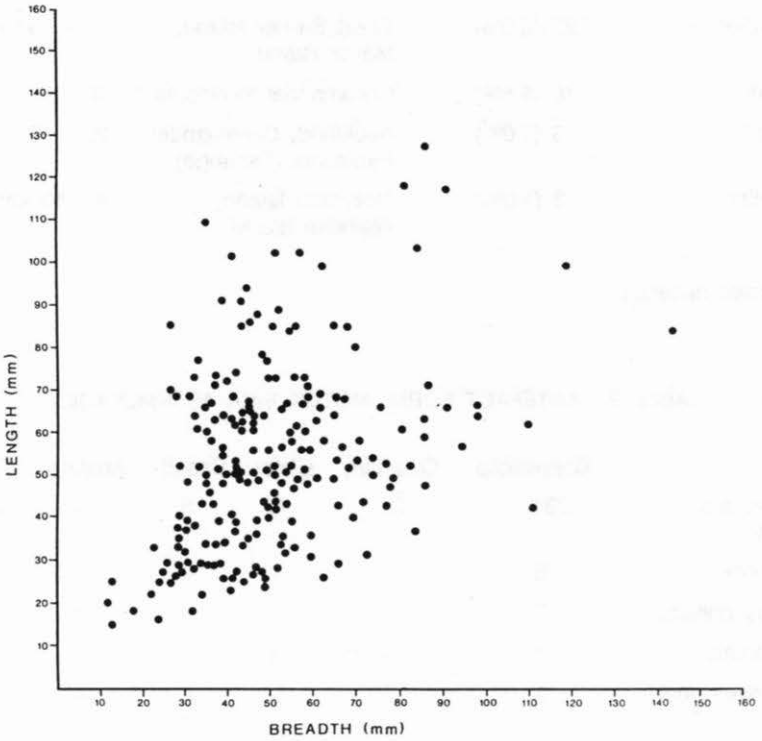

Fig. 3. Scattergraph of greywacke flakes and shatter.

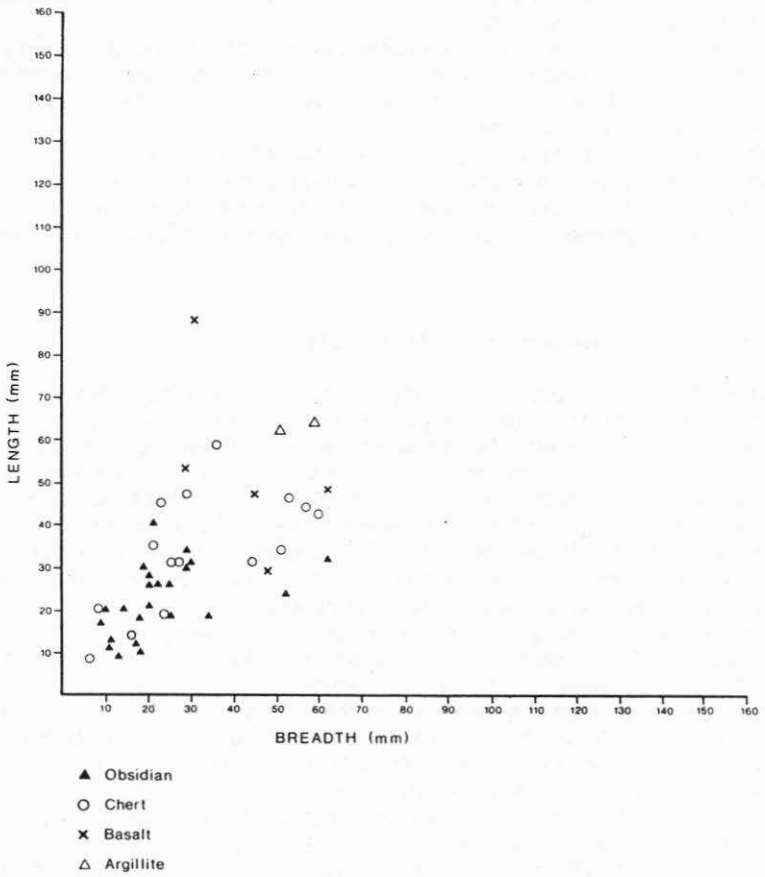

Fig. 4. Scattergraph of obsidian, chert, basalt and argillite flakes and shatter.

All of the artefacts categorised as unfinished adze preforms are greywacke (Table 2). The preforms are small and have roughly quadrangular cross-sections. The largest of these (Fig. 5a) has evidence of extensive flaking on two surfaces. One side bears little evidence of modification, indicating that advantage was taken of the shape of the parent block in producing the desired form of the adze. Another preform is of an unusual narrow form (Fig. 5b), and was probably intended to be fashioned into a chisel.

The only finished adze in the Motukorea assemblage may be of argillite (or possibly fine-grained greywacke) (Table 2). This artefact has been ground to produce a smooth polished finish (Fig. 6a). Evidence of hammer-dressing is visible near the butt and along the edges.

Two possible drillpoints are present in the assemblage (Table 2). These are distinguished by a narrow and slightly curved surface terminating in a point. The shape of the artefacts has been achieved by controlled secondary flaking, along one edge for the greywacke example (Fig. 6b) and along two edges for the chert (Fig. 6c).

INFERENCES ON GREYWACKE ADZE MANUFACTURE

Of the five stone types represented in the Motukorea assemblage, only basalt, argillite and greywacke were likely to have been used in adze manufacture. Obsidian and chert were seldom fashioned into adzes as these materials provide an edge too brittle for tools used for breaking soil and heavy woodworking.

Argillite and basalt, in contrast, were much favoured for adzes. Basalt from the Tahanga source on the Coromandel Peninsula was utilised throughout most of the prehistoric period (Moore 1976: 88). The presence of a small number of basalt and argillite flakes in the assemblage (Table 2) points to the manufacture or reworking of basalt and argillite adzes on Motukorea.

Likewise, many of the greywacke pieces are also probably associated with adze manufacture. The presence of five greywacke preforms in the assemblage presents the most obvious evidence for greywacke adze manufacture on Motukorea. The great variability exhibited in the size and shape of greywacke flakes and shatter (Fig. 3) is also evidence for adze making, in which large flakes would result from initial working and smaller flakes from shaping the preform (e.g. Leach 1984: 114). Some large flakes possess edge breakage (Fig. 7a), but it is not known whether this represents use-wear, secondary flaking or the effects of post-depositional processes (trampling, etc). However, as in excess of 90% of greywacke flakes and shatter do not exhibit edge breakage when viewed at x10 magnification, it is possible that this breakage is associated with deliberate artefact manipulation before the item was discarded. Perhaps these large flakes were chosen from the adze manufacturing debitage for use as unmodified tools or possibly for reworking into more formalised tools.

Although many of the basalt and argillite items probably resulted from adze manufacture, only the greywacke material is present in sufficient quantity to facilitate a reconstruction of the methods and stages in this manufacturing process. This can be carried out in two ways: through refitting items of debitage to elucidate the techniques and stages involved in fashioning adzes (Leach 1984; Leach and Leach 1980), or by reconstructing a generalised sequence for the

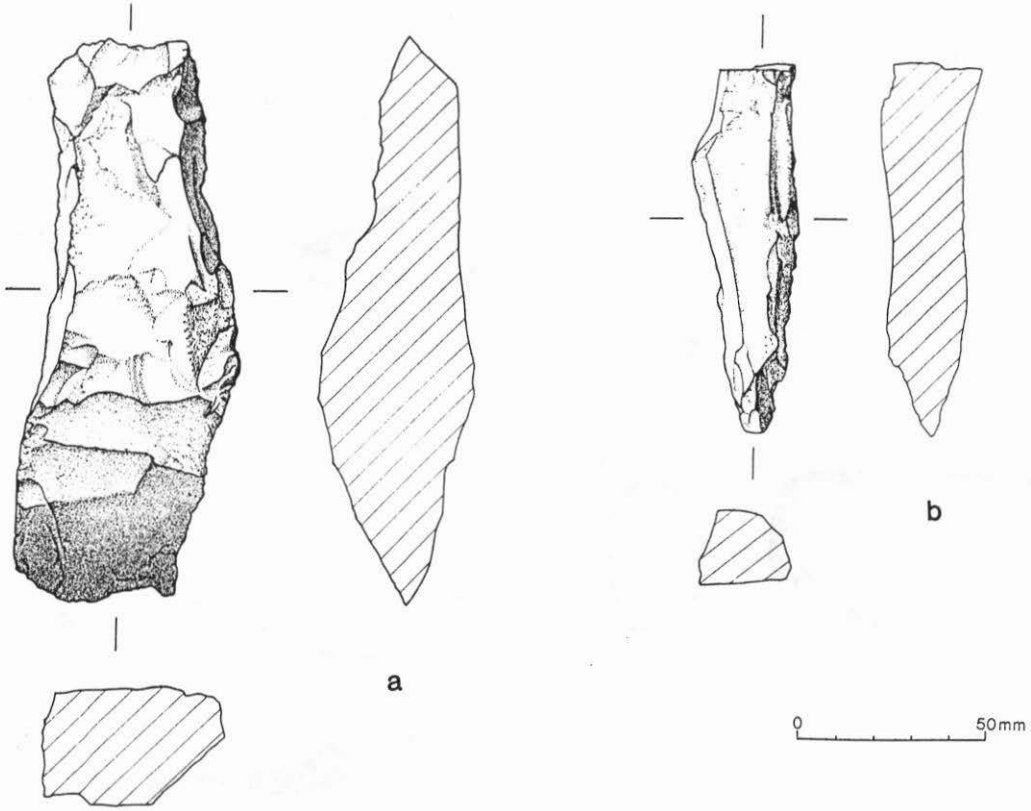

Fig. 5. a. Greywacke adze preform. b. Greywacke chisel preform.

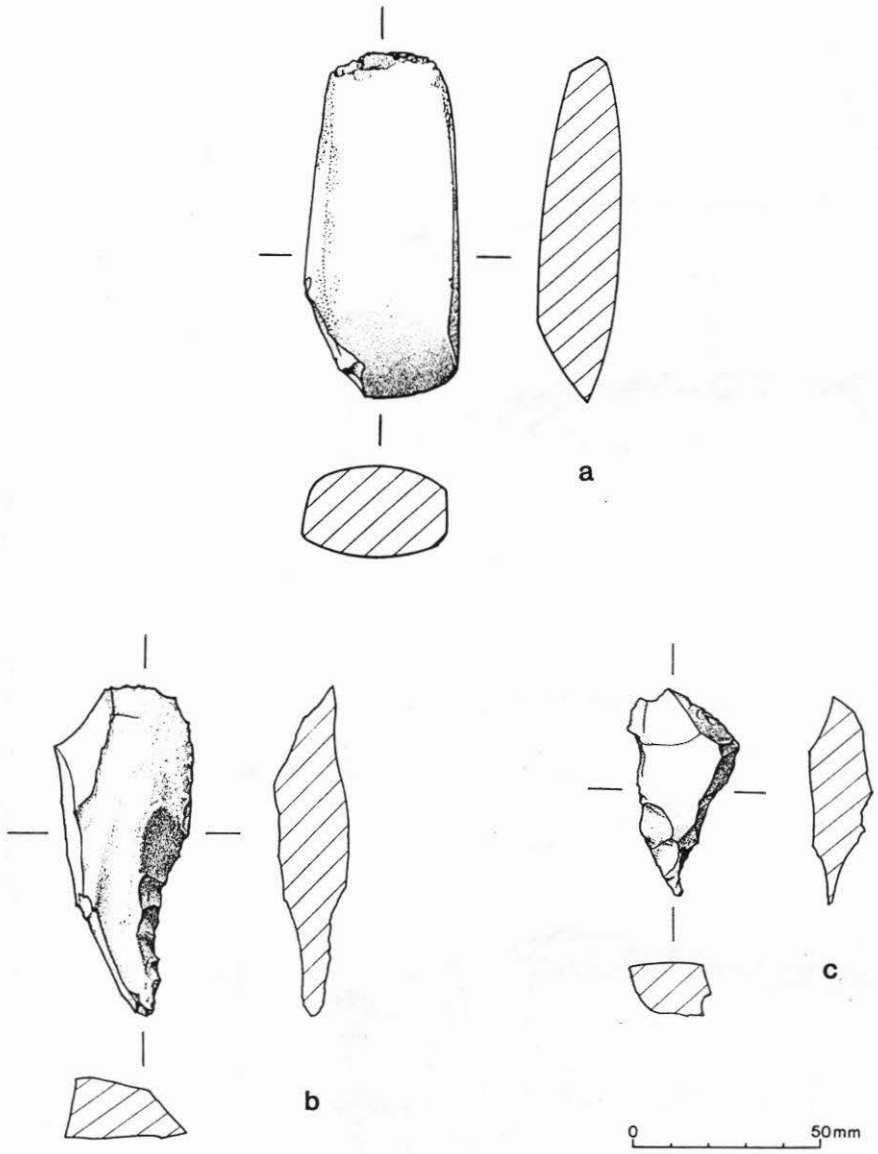

Fig. 6. a. Small adze. b. Greywacke drillpoint. c. Chert drillpoint.

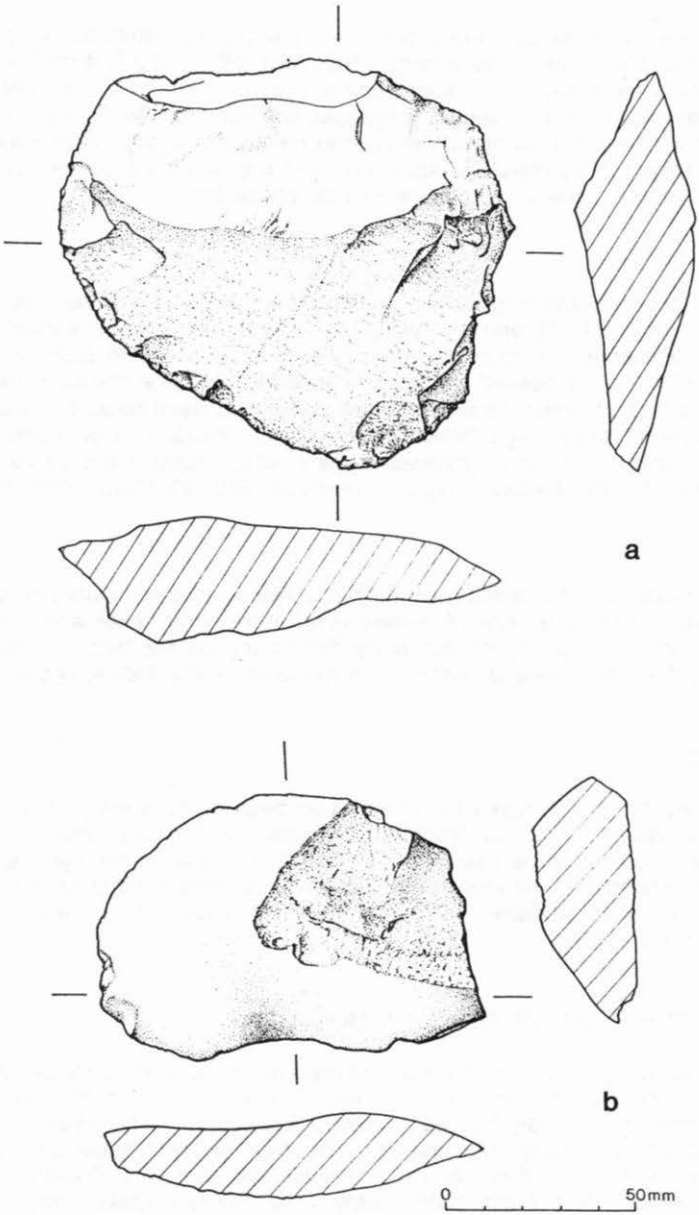

Fig. 7. a. Flake with edge damage. b. Flake from a water-rolled cobble.

stages in adze manufacture from evidence provided by attributes of artefact morphology (Brassey 1985; Challis 1978: 41ff; Jones 1984). The first method relies on the careful excavation of archaeological material and therefore cannot be applied to the sporadically collected greywacke artefacts from Motukorea. Instead an attempt will be made to apply the second method to this body of material.

Two stages in a generalised adze manufacturing sequence can be discerned from the evidence, while a third stage can be postulated:

Stage One

This involved obtaining stone, probably from Motutapu Island and/or the Tamaki isthmus (Table 1), and transporting unmodified or partially worked beach cobbles to Motukorea. Unsound material was then removed in preparation for flaking the block to the desired shape. Evidence for this stage comes in the form of large decortication flakes bearing remnant cortex and water-rolled surfaces (Fig. 7a, b). Some of these large flakes were possibly intended to be worked into adzes. A number of such greywacke flake adzes have been identified in assemblages from the Auckland region (Davidson 1970: 50; Furey 1986: 14).

Stage Two

This stage saw the shaping of the block into a preform. Evidence for this stage is found in the presence of numerous small trimming flakes and pieces of amorphous shatter (Fig. 3), produced by flaking the parent block. The adze preforms in the assemblage possess direct evidence of this flaking process (Fig. 5a, b).

Stage Three

This would have involved the finishing process in which the preforms were shaped into adzes. As no finished greywacke adzes are present in the assemblage, it can only be assumed that this final stage in the manufacturing process was undertaken on Motukorea. However, a small number of greywacke flakes bear polished surfaces, indicating that completed adzes were at least reworked on the island.

THE PREHISTORIC USE OF STONE ON MOTUKOREA

This study of a group of surface collected stone items from Motukorea has revealed that the past inhabitants of the island obtained a range of stone types from a number of sources for use in tool manufacture. The types of stone material utilised are similar to those recorded from archaeological sites in the Tamaki isthmus and on other islands of the Hauraki Gulf (e.g. Davidson 1970; Foster and Sewell 1989; Furey 1986; Leahy 1970; Prickett 1989). Most of the stone was probably collected from sources within 70 km of Motukorea, either by direct exploitation or through down-the-line exchange. However, some items of obsidian were in all likelihood obtained from a distant Mayor Island source.

It is not known whether stone was prepared before transportation to

Motukorea. Obsidian and chert would have been quarried from outcrops and obtained as river cobbles. Some initial processing of these two materials at the source areas is likely to have occurred. The same probably held true for the greywacke, as discussed above, and possibly the argillite. Adze preforms of Coromandel basalt may have been transported to Motukorea from the quarry at Tahanga (Moore 1982: 35), although the presence of flakes of Tahanga basalt could indicate that some of this material was transported to the island as prepared parent blocks.

After transportation to Motukorea the stone materials were made into a variety of tools. Obsidian and chert were flaked to produce unmodified tools possessing sharp cutting edges. Chert was also used for more formal tools, as shown by the presence of a carefully shaped drillpoint in this material (Fig. 6c). Drillpoints are recorded ethnographically as being employed in tasks involving boring through stone and bone, such as in the manufacture of ornaments and fishhooks (Best 1974: 72ff).

Most of the basalt, argillite and greywacke items were almost certainly associated with the manufacture or maintenance of adzes. However, the presence of a greywacke drillpoint (Fig. 6b) indicates that other tools were also produced. Possible additional evidence for this comes from the presence of edge breakage on a number of large greywacke flakes.

CONCLUSION

In conclusion, this study has demonstrated that the prehistoric inhabitants of Motukorea utilised a number of stone types in the manufacture of a range of both formalised and unmodified tools. To further this research an archaeological excavation is required of one or more of the stone-working areas identified on Motukorea. This will overcome problems of sampling bias and lack of chronological control associated with surface collected material. Such an investigaion would facilitate a more comprehensive study of past stone tool manufacture and use on the island, thereby greatly expanding our understanding of prehistoric lithic resource use in this region of northern New Zealand.

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