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Archaic and Classic Maori Relationships at Long Beach, Otago: the Artefacts and Activity Areas

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ABSTRACT

Excavations at the open-bay site of Long Beach (S164/20), Otago, produced large assemblages of artefacts from two major periods of occupation. The early period, dated to the 13th-15th centuries, was represented by three layers of midden material, above which were working floors, middens and a substantial house of a mid-17th century Maori settlement. The lower layers of occupation contained some typically Archaic artefacts, as well as a transitional form of barracouta point. In the upper level of occupation there were several of the artefact styles characteristic of Classic Maori assemblages in Otago, though the fish hooks did not display the fully "baroque" style of Late Classic. Nephrite was being flaked as well as sawn, suggesting the persistence of an Archaic method of working nephrite into an Early Classic assemblage. The particular combination of technologies employed and the artefact styles favoured in each of the assemblages suggest some cultural continuity rather than a sudden complete replacement by peoples with Classic artefact assemblages.

Keywords: NEW ZEALAND, OTAGO, ARCHAIC, CLASSIC, TRANSITION, ARTEFACT ASSEMBLAGES.

INTRODUCTION

Using artefact styles as culture markers, prehistorians initially divided the prehistory of Murihiku into two phases or periods, Archaic (Moa-hunter) and Classic Maori. With the detailed studies of Lockerbie (1940, 1959), Simmons (1967, 1973) and Hjarno (1967) came the implication that the Archaic could be subdivided into Early and Late (the result of internal developments and adaptations) and that Classic Maori in Otago represented an intrusion from the north. The nature of that intrusion has been the subject of several papers (e.g. H. M. Leach and Hamel 1978, B. F. Leach 1978, H. M. Leach 1978). The transition from Late Archaic to Early Classic in Otago has not been documented from securely provenanced and dated assemblages of artefacts, though Simmons (1967) was able to demonstrate a continuity of technologies and styles between the lower (Archaic) and upper (Classic) layers of Little Papanui, Otago Peninsula (S164/1). It is uncommon for Classic assemblages to be stratified above Archaic assemblages in Otago sites, and it was known that numerous Classic artefacts had been collected by curio hunters from Long Beach. It became a matter of controversy during the 1950s whether or not there had been occupation at Long Beach prior to the Classic Maori period. Skinner (1953:401) argued that quantities of charcoal in wind-blown sand beneath the late occupation site had been blown from an earlier site.

When a farmer at Long Beach requested assistance from the New Zealand Historic Places Trust to determine the boundaries of the site S164/20 on his property, investigations were undertaken by the authors (N.Z.H.P.T. Permit 1977/65) to discover not only the extent but also the nature of the undisturbed material. Occupation was found to extend over nearly 30 hectares of old consolidated sand dunes behind more recent beach dunes (Fig. 1), but only about two hectares below the central hill slopes appeared

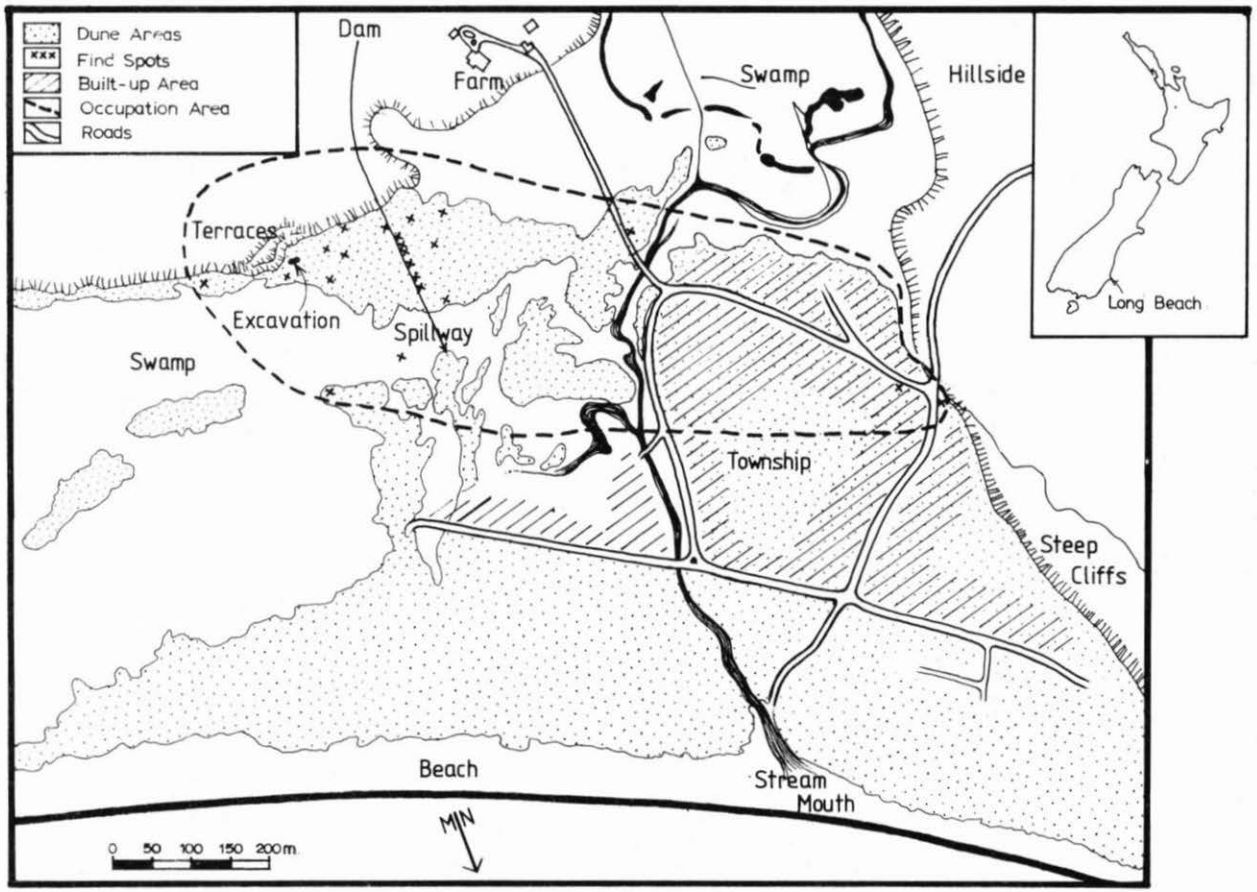

Figure 1: Map of the Long Beach area showing topographical features and location of the site, S164/20.

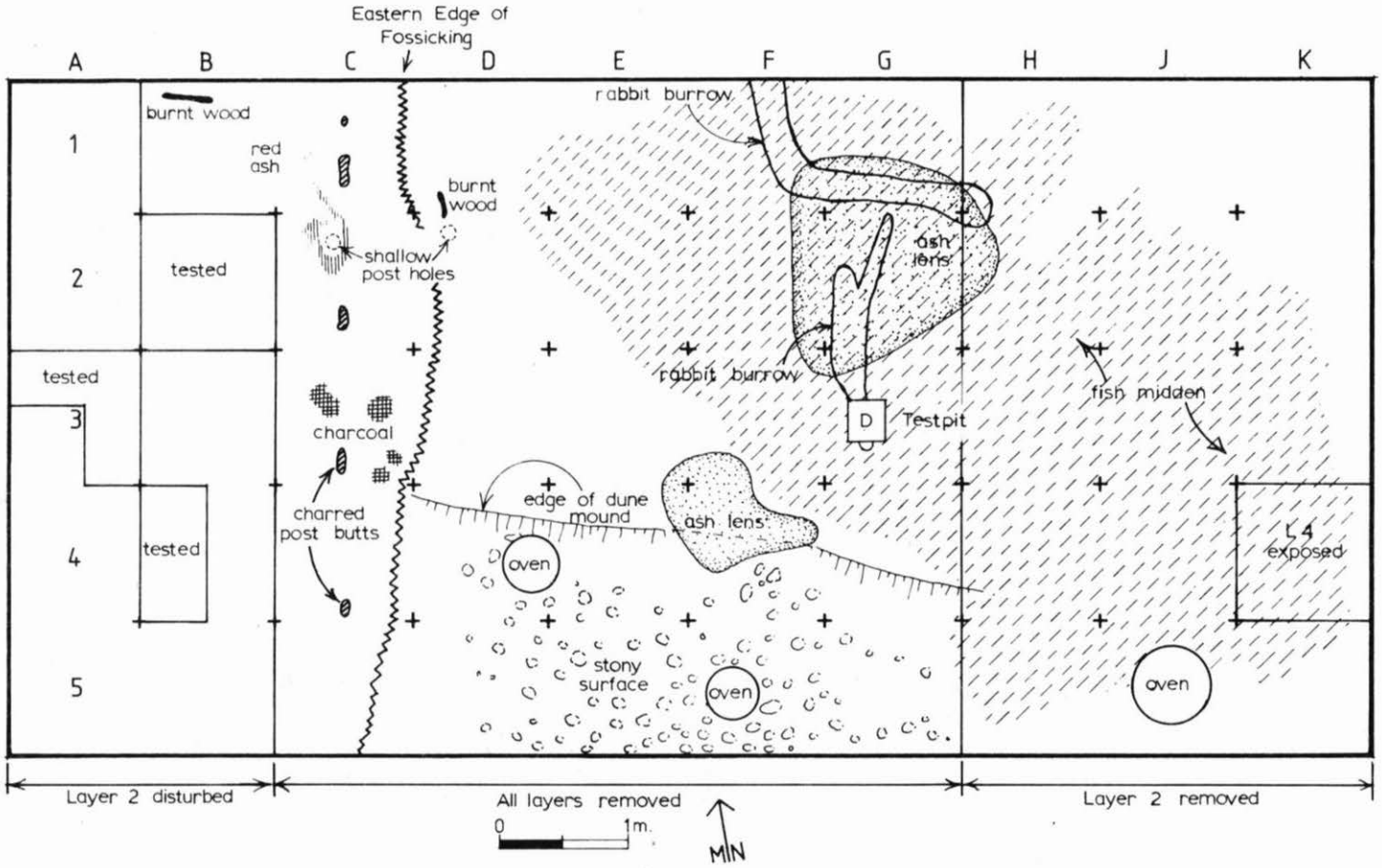

Figure 2: Site plan of S164/20, Long Beach, showing Layer 2 features: posts, post holes, ash lenses, ovens, midden, the fossicked area and the excavated area.

to be undisturbed by curio hunters. With financial assistance from the New Zealand Historic Places Trust, one area (5 × 10m) was examined in detail over a four week period, November-December 1977.

STRATIGRAPHY, DATES AND PREVIOUS COLLECTIONS

The upper layer of occupation material proved to be a mosaic of patches of dense fish bone midden and working floors with the wall of a substantial house at one end of the excavation (Fig. 2). Disturbance by curio hunters was limited to this upper layer within and along the wall of the house. The layer (Layer 2 on Fig. 3) was radiocarbon dated to A.D. 1630 ± 89, a date which was perfectly consistent with the Classic

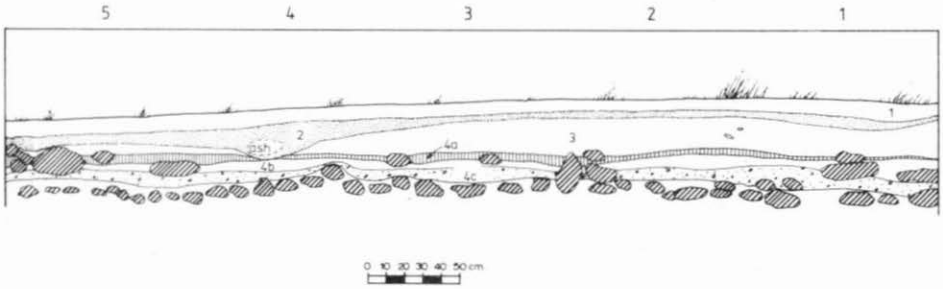

Figure 3: Stratigraphy of eastern edge of F line of squares, S164/20.

Maori artefact types recovered from it (Hamel and Leach 1979, Leach and Hamel 1978). Sealed beneath this layer by wind-blown dune sand (Layer 3) were three layers containing artefacts of Archaic types (Layers 4a, 4b, and 4c), scoop hearths and a child burial (Fig. 4). Acceptable radiocarbon dates (Hamel and Leach 1979) were A.D. 1217 ± 59 for the basal layer of dense fish bone midden (4c), which had been deposited on a boulder bank close to the sea, and A.D. 1460 ± 58 for Layer 4a of thin midden which marked the end of Archaic occupation in this location following minor damage from wave action.

This excavation not only provided the first radiocarbon dates for Long Beach but an assemblage of Classic and Archaic artefacts with far more secure associations (both with other artefacts and with faunal remains) than those of the thousands of items recovered earlier and deposited in the Otago Museum under the designation "Long Beach". The artefacts from the 1977 excavation and the inferences made from their distribution and associations form the subject of the present paper. Other papers in preparation and a thesis will deal with the extensive faunal remains, stratigraphical history and changing physical environment of the site.

Curio collecting at Long Beach had begun by 1912 with the activities of T. G. Reid and H. D. Skinner. Material recovered by them included adzes, bird spear points, fish hooks and pendants. A large collection was obtained by the Otago Museum from J. W. Murdoch in 1920, and the land-owner, Driver, sold artefacts which he had recovered in the 1920s. Throughout the 1920s and 1930s Skinner's students and colleagues, who included Miss V. Barron, Miss de Beer, Wili Fels, and Dr. Gordon Dempster, periodically visited the site. The Otago Museum bought C. E. Napier's collection in 1928 for £95, not a large sum considering the fact that many of the items were of greenstone. David Teviotdale worked in the area sporadically from 1929 to about 1940 but his efforts were usually concentrated elsewhere because Driver had forbidden digging, allowing only "fossicking" (surface collecting). Whether this applied to all the collectors is uncertain, especially to S. V. Johnson who assembled one of the largest collections during the 1930s.

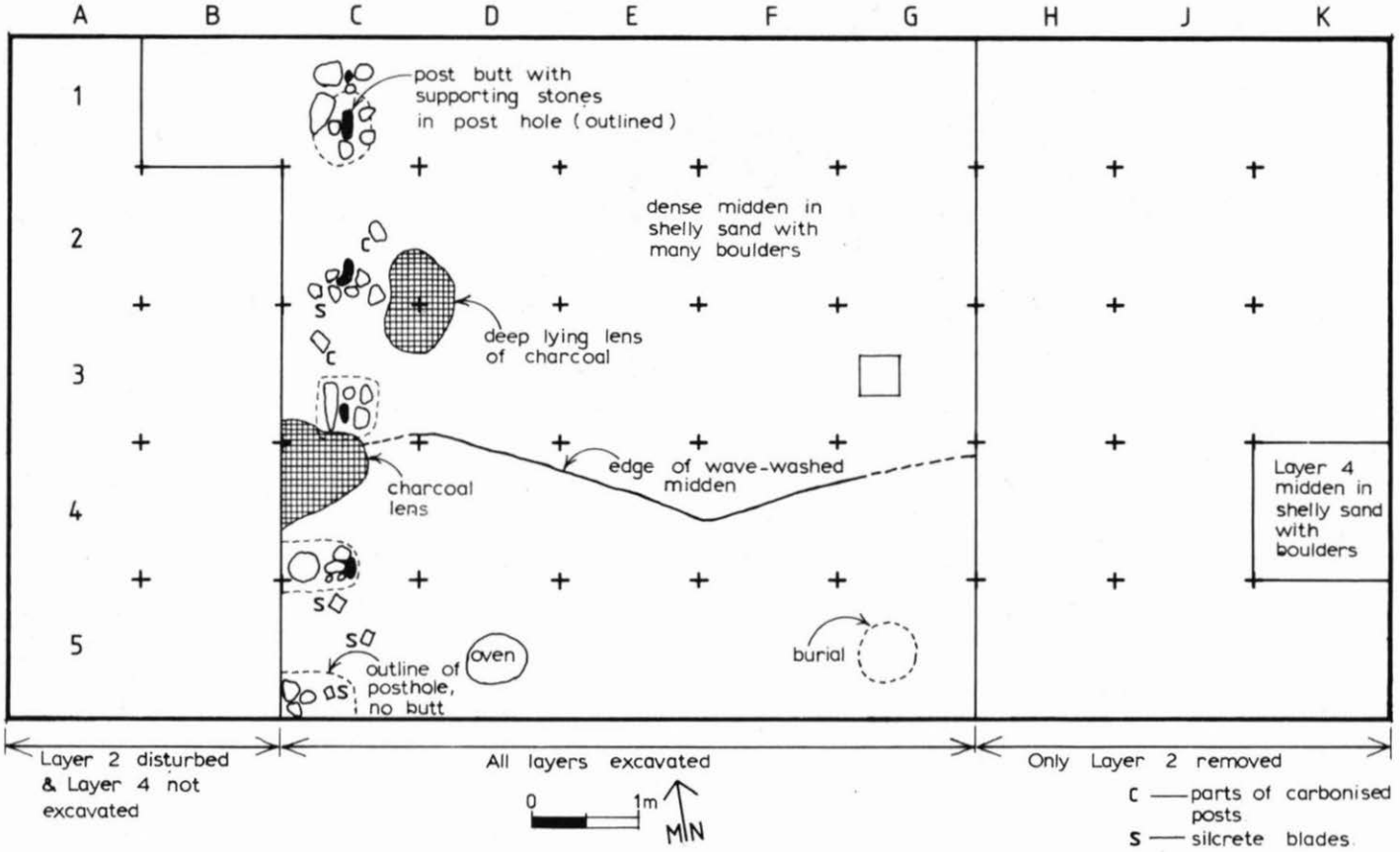

Figure 4: Site plan of S164/20, Long Beach, showing Layer 4 features.

Activity seemed to decline during the 1940s until the first publications appeared following the discovery of four burials by Dawson, Yaldwyn and Dempster (Dawson 1949, Dawson and Yaldwyn 1952). The section on which Skinner (1953) based his hypothesis for the presence of early occupation layers was apparently dug quite close to the 1977 excavation in which these early layers have now been located. According to one collector (H. L. Lewis: pers. comm.), the curio collectors concentrated on the highest dune lying to the west of the 1977 excavation, using the periodic shifts in the dune sands to uncover fresh deposits of midden and artefacts. Thus disturbance to this very large site has been patchy and at the eastern end at least has been limited to the upper layer.

Over 1300 artefacts from Long Beach had been registered by the Otago Museum prior to the 1977 excavation. When the privately held material and that in the Auckland Museum is included, it is expected that over 2500 artefacts can be provenanced to the Long Beach area. The artefacts obtained in 1977 will give a basic chronological framework for evaluating this huge collection and those from neighbouring beaches (Murdering Beach and Kaikai Beach) which also have evidence of several periods of occupation.

THE ARTEFACTS FROM LAYER 4

INTRODUCTION

Considering the nature of disturbances to Layer 4, firstly from some wave action and then from wind action as dunes developed on the old boulder bank, and finally from the Classic Maori practice of oven digging, it should not be expected that the Archaic materials reflect in their spatial distribution any meaningful activity areas. Indeed the three components of Layer 4 (a, b, and c) are recognisable only on the inland edge of the site. In two squares (C5 and E5, Fig. 4) there was an unusual density of artefacts, with 34 and 24 items respectively, compared with an average of less than three items in other squares from which Layer 4 was removed. Between these squares lay D5 which contained a single lump of pumice. Close to this square the section showed a shallow channel along which a portion of a wave may have advanced, displacing cultural material into the squares on either side. Alternatively these two squares may be considered the surviving intact remnants of an Archaic midden site well-endowed with stone and bone artefacts, which elsewhere have been displaced, damaged or destroyed by the wave action.

BONE ARTEFACTS

Five items of fishing gear (three lure and two bait hooks), one worked slab of whalebone, and two small worked fragments of moa bone were distributed over six squares, not all contiguous. The lure hooks (Fig. 5) consisted of a broken (?dog) ivory point of a possible barracouta lure (Z2188, from Layer 4c), a similar point possibly made from moa bone (Z1838, from Layer 4a), and a relatively complete lure point also possibly made from moa bone (Z2170, from top of Layer 4).

The latter point is particularly interesting because it is morphologically intermediate between the simple curved point present in the 12th century Palliser Bay, Wairarapa (B. F. Leach 1979:103) and Archaic Pounawea (Lockerbie 1959:Fig. 40) and the more elaborate form (Fig. 5) which has a lug or dog-leg corner on the outside curve and often serrations between the lug and the point tip (Hjarno 1967:18, Fig. 7). The Long Beach point is not serrated but has an obvious lug formed by cutting a notch into the outside curve about half way down and filing away material below the lug to make a straight leg for insertion into a drilled wooden shank. (Interpretation of this point as an *unfinished* serrated form occurring in a generally Archaic assemblage is tempting, but until such an association is found we prefer the stricter interpretation.) The purpose of the lug might be to prevent the point from slipping upwards by securely anchoring the lashings and to act as a stop against the whole point slipping down through the hole in the shank. This is the earliest documented example from a dated

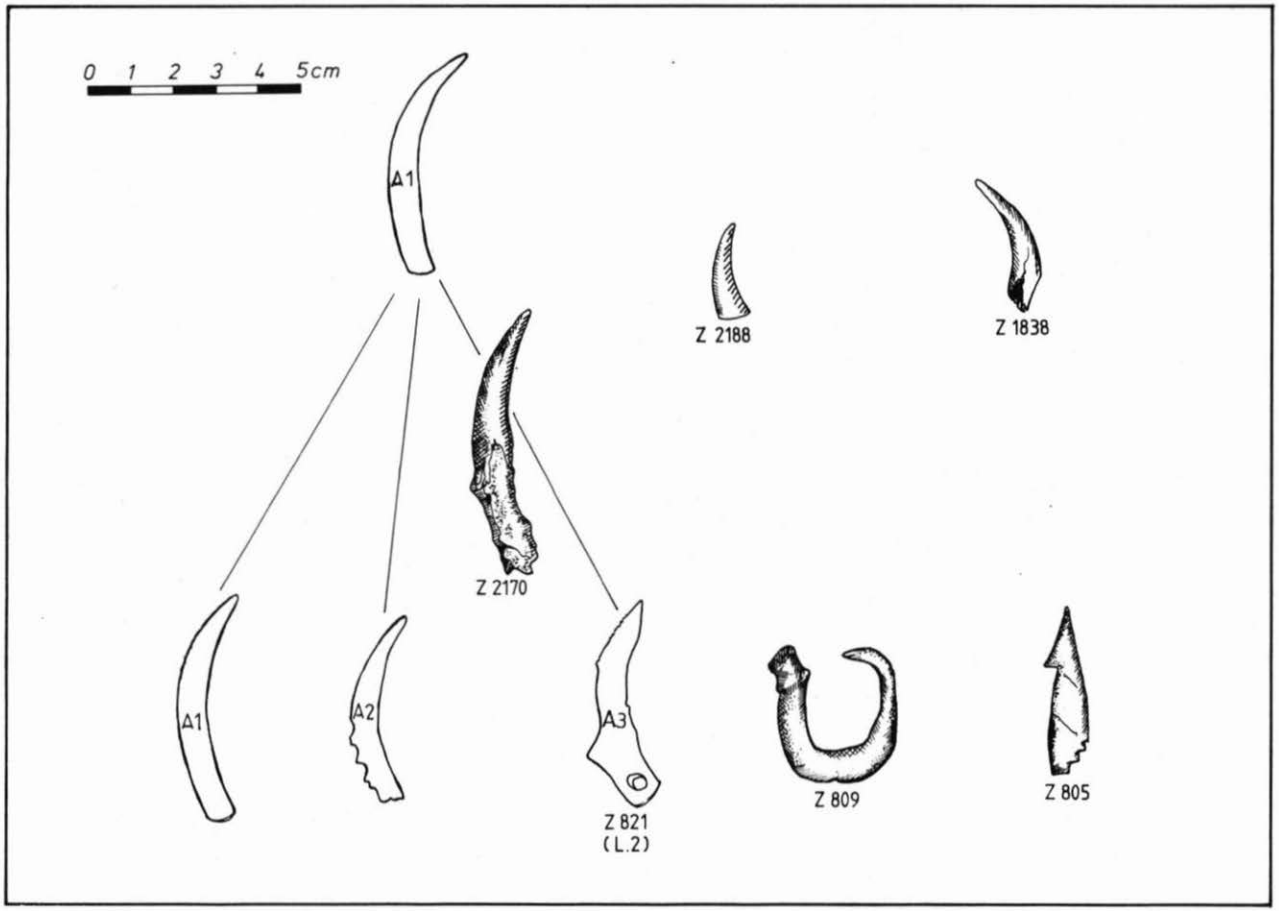

Figure 5: Bone artefacts from Layer 4, S164/20, and diagram showing evolution of barracouta hook.

Archaic layer and provides important evidence of internal development in the Murihiku fishing kit.

The situation is not a simple transformation from one form into another, however, but a divergence (Fig. 5) of an early plain type (Hjarno A.1) into a serrated unlugged type (A.2) and a lugged or dog-legged and sometimes serrated type (A.3). Both A.2 and A.3 occur in Classic Maori sites in Murihiku including the upper layer at Kings Rock (Lockerbie 1940:Figs. 28–31, 51), Huriawa (Karitane: Menzies n.d.), Tarewai Point (Simmons 1967:46) and the top layers at Little Papanui (Simmons 1967:34, 45). In some of these sites the simple form (A.1) also persists. In its most elaborate form with a drilled basal hole, a notched lug, and fine serrations on the point, the A.3 type must have required greater effort in manufacture than A.1 or A.2. The question arises as to why two or even three types were used concurrently to capture the same voracious fish which has the reputation of striking at any darting object. It is possible that the more elaborate point A.3 was not in fact a barracouta lure, but was designed to take the kahawai or even southern kingfish. Against this theory, however, is the marked scarcity of their bones in the fish middens. A more plausible explanation might involve a technological factor: the dog-leg form with or without the lug is considerably wider and therefore more robust at the point of greatest stress (the inside centre of the curve) than the narrow, smooth curve varieties. Coutts and Jurisich (1973:78–80) have argued that it is theoretically possible "to make eight fish-hooks from the two sides of a dog mandible", some of which would bear the desirable dog-leg curve (of the ascending and horizontal ramus) and others the smooth curve of the lower edge of the mandible. Thus the shift in types may reflect a desire for a more robust point which could be manufactured from a readily available material unlike fresh moa bone, the supply of which would depend on the success of the hunt. At the same time the older style, which was formerly rendered in moa or human bone, could continue as a useful by-product of utilisation of the dog mandible. According to this interpretation the lure from the top of the Archaic deposit from Long Beach represents early experimentation with thickening of the hook at the point of greatest stress, before the move from moa bone to dog mandible became widespread. It should be noted that the other moa bone lure point from Layer 4a (Z1838) exhibits a facet on the outer edge at the base which is very common in the dog-leg (A.3) type.

The two bait hooks recovered from Layer 4 were a complete, moa bone, one-piece hook (Z809) and the bone point of a composite hook possibly made from human bone (Z805, from Layer 4b). The one-piece hook is sub-circular with an incurved point and an apparently deliberate basal notch formed by three grooves, which Hjarno (1967:32) would describe as a bait notch. This hook would not look out of place in the Archaic sites of Tairua (North Otago) or Papatowai or in the bottom layers at Little Papanui. Although only two thirds the size, it is morphologically very similar to the sub-circular one-piece hook found in 1947 with another hook, a paua shell and a nephrite adze in an undated burial at Long Beach (Dawson 1949:59–60). This burial was found about 1.05m beneath a thick midden layer which is probably contemporary with the Classic Maori midden layer in this site, judging by the absence of moa bone. The dating of Z809 to an Archaic occupation may tip the balance in favour of attributing Archaic status to the burial, which Dawson considered doing on the ground of the poor workmanship of the adze, but rejected because the burial was flexed rather than extended. Now that it has been demonstrated that Archaic burials involved several different burial positions (B. F. Leach 1977), the case is even stronger that this burial was made in the Archaic phase.

The composite fish-hook point from Layer 4b is internally barbed, and has three notches on the base for securing the lashings binding the point to the shank. It belongs to Hjarno's class C.3.a. which he regards as typical of the Late Archaic but persisting into the Classic Maori phase. At Little Papanui this form was recovered from both upper and lower layers (Simmons 1967:17, 34).

Large slabs of worked whalebone are not uncommon on Murihiku sites. A 26cm long piece (Z841) from the top of Layer 4 may be from a vertebral disc. It displays

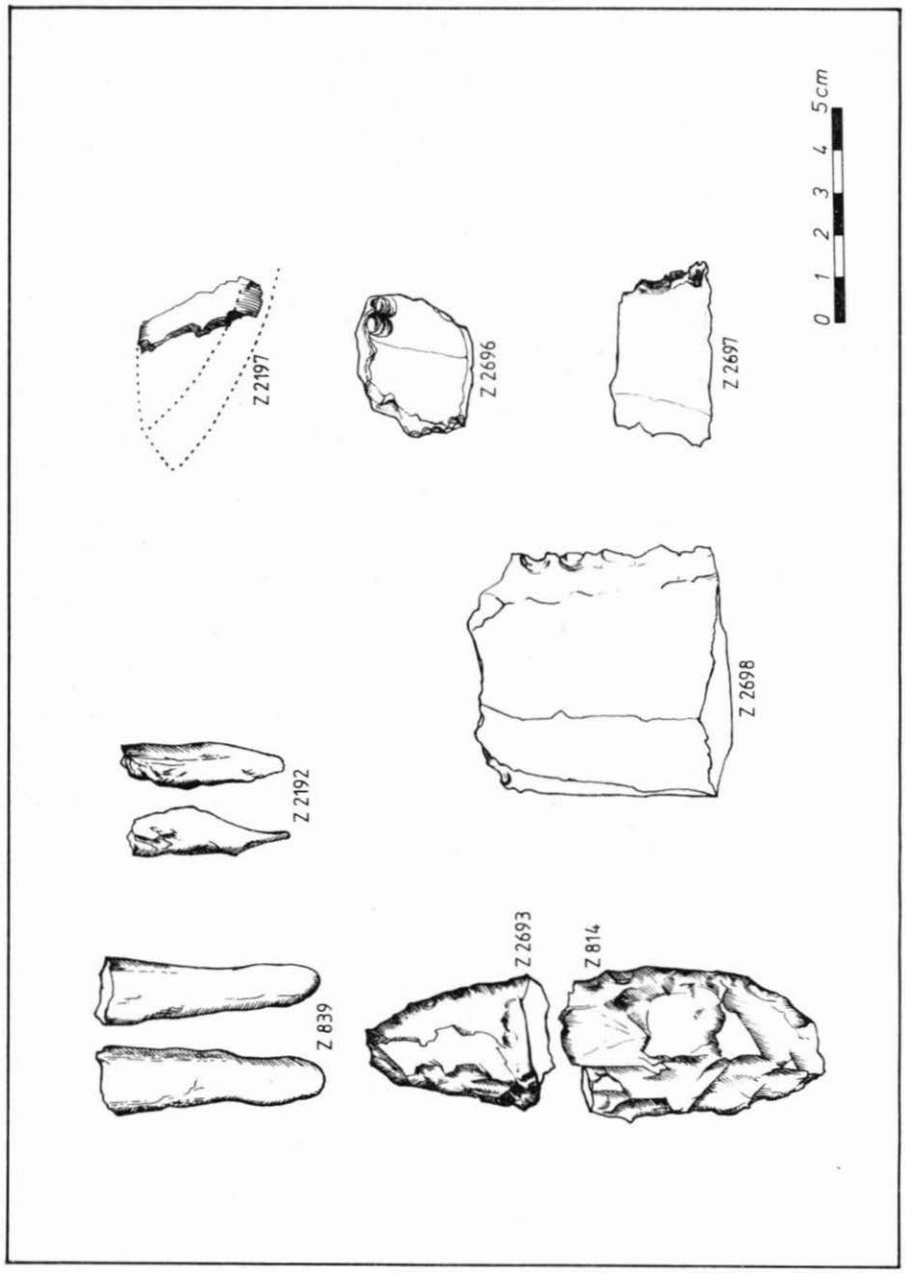

Figure 6: Stone artefacts from Layer 4, S164/20.

one cut edge with the remaining edges badly eroded. The bone appears not to have been dense enough for manufacture of a club or comb. At Kings Rock whalebone was sometimes used as fish hook material in both layers, and Lockerbie also recovered a shallow trough-shaped artefact about 57cm long as well as some large flat pieces from the upper layer (Lockerbie 1940:416). Whale bone slabs of uncertain function were found at Murdering Beach. In the Otago Museum collections from Long Beach are several objects made from whalebone including a "drinking cup made of black-fish vertebra" found by David Teviotdale "about 2 feet from surface" (D40.406), "worked whalebone" recovered by T. G. Reid (D32.724) and the butt of a whalebone club found by Napier (D28.536). It appears that the industrial use of whalebone goes back at least to the Late Archaic in Murihiku.

STONE ARTEFACTS

Two schist files (Z839, Z2192) were recovered from adjoining squares, G2 and G3. (Fig. 6). These are "undercut point files" in Simmons' (1967:22) classification, because the point has been ground away more on one side than the other. At Little Papanui seven similar files were recovered from the bottom layers and only one from the top (Simmons 1967:51). From handling museum collections derived from Murihiku sites one gains the impression that this type of file is only common in Archaic sites and that its distribution may be correlated with that of the one-piece fish hook. The asymmetrical wear on the point may relate to the task of filing the inner edges of the fish hook, a task in which the operational angles between file, hook and the artisan's hands might be confined to a narrow range, predisposing the file to uneven wear. Four fragments of a possible file of micaceous schist were found in Square E5.

A fragment of a black ?basalt adze was recovered from Layer 4c in Square G5 (Z2197). Judging by the angles of the three ground surfaces this is part of the bevel of a large quadrangular adze (Duff Type IA), a well known Archaic type. A large number of black volcanic rock adzes have been recovered from sites in the East Otago area and, although one source of black basalt was utilised by the occupants of Brighton Island south of Dunedin (von Haast 1879), this was almost certainly not the only source known to prehistoric people.

Two halves of a small flaked adze preform (Z814 and Z2693) were recovered from Squares C5 and E5. The butt was found in Layer 4a and the bevel end (which was flaked a little after the fracture) at the base of a scoop dug down from Layer 2. There is little doubt that the adze belonged in the upper Archaic layer. It had been made from a thick flake of a greenish, mottled, volcanic rock which is believed to outcrop in the vicinity of Mapoutahi between Doctors Point and Purakanui. Unflaked parts of the dorsal surface were waterworn. The flaking was directed from both sides (bilateral) on to the dorsal surface and from one side on to the bulbar surface which would have become the front of a small sub-triangular or plano-convex adze if the adze had been finished. The bevel was only partly made when the transverse fracture occurred, and no hammer dressing or polishing had begun. Adze preforms in this condition are normally recovered from a working floor area or sites a short distance away (c.f. Riverton and Wakapatu – H. M. and B. F. Leach 1980). There is some evidence of the final stages of adze trimming in the Long Beach site in the form of small chips of the same greenish volcanic rock. Ten were found in the same square as the preform butt, three in the same square as the bevel and a further 11 were scattered through the water-washed Layer 4 deposit in the vicinity of D1. One flake from D1 is a definite secondary (Class B) trimming flake, struck during the shaping of an adze (H. M. and B. F. Leach 1980). Together these constitute evidence of adze manufacture but only on a very small scale, utilising what may have been a local source of poorer quality rock for adze manufacture than the more distant sources of argillite.

Two Layer 4 flakes from adjoining squares, F4 and F5, appear on hand specimen examination to be from one of the argillite sources in Southland. Both have a single well polished curved surface, and one also displays a polished straight surface butting on to the curved face. They appear to be from the same adze but its type cannot be established.

Among the most diagnostic artefacts from Layer 4 are three sections of silcrete blades (Z2696, Z2697, Z2698), two of which were recovered from Layer 4c while the other is attributed just to Layer 4 (Fig. 6). All three were from Square C5 and display deliberate unifacial retouch along their sides affecting both the bulbar face and the dorsal surface. Superimposed on the retouch are signs of use damage. Close examination suggests that these are discarded fragments of whole blade tools, although parts of their edges may have been used before and after the blades had snapped into sections. Two of the sections are from the platform end of the blade although the platform itself has been modified by edge hammering in one case and totally removed by flaking in the other. This evidence of deliberate modification prior to use contrasts with the attitude of both Classic and Archaic artisans to their small flake tools which were apparently selected for their fortuitously produced edge characteristics (H. M. Leach 1979:147). In contrast to the small flake tools these silcrete blade sections show use damage over a greater length of edge which is usually straight rather than concave. The effective edge angle in both classes ranges from medium to steep (50–90°). If scraping is the activity which produced this edge damage, the whole blades or blade sections would possess an efficiency advantage over small flake tools when scraping and smoothing broad flat surfaces, such as planks. For scraping curved surfaces such as bird spear shafts or elaborately carved boxes or panels, the small flake tools would be necessary.

Utilised and waste flakes (as distinct from blades) are scattered over 13 squares. In addition to the green volcanic chips, four greyish-brown chips of similar texture were also recovered which may come from the same source, since colour changes are common between the interior and exterior of a large block. An irregular-shaped flake of the green material from E5 had several small battered areas on it and may have been used as a small hammer. Silcrete was represented by ten apparently waste flakes, six flakes with utilised edge sections and the three blades described above. Obsidian, although uncommon, was also well used with two of the four flakes displaying significant edge damage. Two flakes were green in transmitted light and two were grey. In contrast, various types of semi-translucent chalcedony were plentiful but only as waste flakes. However, it is suspected that the edges of this material are rather more resistant to edge damage than those of obsidian or chert. Chert, characterised by its pronounced lustre, occurs in two main colours, yellow and grey. Of six chert flakes found in Layer 4, two had been used. Porcellanite occurs in an opaque, non-lustrous, pale-green and nearly black type. This non-lustrous porcellanite may be attributed to the Moeraki Peninsula along with the chalcedony and possibly the chert. One flake of opalline jasper may be derived from the Otago Peninsula.

THE ARTEFACTS FROM LAYER 3

INTRODUCTION

On stratigraphical grounds Layer 3 represents a hiatus in occupation of this site (but not necessarily of the whole Long Beach area). It was a period of dune build-up, and the wind which brought this about probably also eroded and redistributed lighter material from exposed Archaic occupation sites. The Classic Maori occupants moved on to the top of this undulating probably sparsely covered dune surface, and some of their activities (such as house and oven building) undoubtedly resulted in downward movement of a few artefacts and midden components. It is possible to make a series of intelligent guesses as to the likely origin of particular artefacts in specific squares, but in essence it has to be accepted that the artefacts variously come from two ends of a period of time between Late Archaic (Layer 4a – about 15th century) and Early Classic (Layer 2 – about 17th century).

BONE ARTEFACTS

The eight bone artefacts found in Layer 3 comprise the tip of a bird spear, a bone awl, a piece of worked moa bone, and five complete or broken composite fish hook

TABLE 1

STONE ITEMS FROM LAYER 4

	Waste Flakes	Used Flakes and Artefacts
Obsidian – grey	1	1
– green	1	1
Silcrete	10	6 plus 3 blades
Chalcedony	17	–
Green chalcedony	4	–
"Crazed" chalcedony	7	–
Non-lustrous porcellanite		
– pale green	1	–
– black	2	–
Chert – yellow	1 (microblade)	1
– grey	3	–
– white	–	1
Opaline jasper	1	–
"Volcanic" – green	25	1? plus 1 adze preform in two pieces
– grey-brown	4	–
– black	1 adze frag.	–
Schist	4 file frags	2 files
Argillite (?Southland)	2 adze frags	–
	84	17

points (Fig. 7). The bird spear point (Z1840) from Square K4 may have been made from human bone. The tip has broken off at the first notch. Bird spears are well represented in museum and private collections from Long Beach (over 88 in Otago Museum). Simmons (1967:47–8) states that "it is absent from the lower layers of all early sites in Otago", while noting that 21 were obtained from the bottom layers at Little Papanui; surprisingly there were none from Kings Rock. The impression is given that the bird spear appears in Late Archaic layers, gaining in popularity in the Classic Maori phase. It has seldom been considered to what extent the proximity of forests affects the numbers of bird spears in a site, but it is worth noting that bird spears were not found at Huriawa or Katiki Point which are traditional "pa" sites set in exposed coastal locations. Simmons (1967:47) also states that the bird spear "is also absent from the North Island Archaic" but 17 have been found in the 12th century level at the Washpool site in Palliser Bay (B. F. Leach 1979:106). It is interesting to speculate whether the later appearance of the form in Murihiku stems from a Cook Strait influence in the 14th or 15th century.

A cut or split section of moa bone (Z2187) was recovered from Square F2. It could have been intended for use as a straight composite fish hook point. The bone awl from Square F3 (Z826) has been manufactured from the shaft of a bird limb bone and the fully ground bevel in lateral view is a smooth curve from heel to apex (Cave 1976:25–7, 31). The point is smooth and blunt and the artefact may have been discarded for this reason.

Three fish hook fragments were found in Layer 3 in Square G4. One item (Z2168) is the broken-off base of a small composite fish hook with three notches for lashing. In shape the complete hook was probably similar to Z823 (discussed below). The second fish hook base (Z2183) found nearby has only two notches and is twice the size of the first. The complete hook made from solid birdbone may have been over 6cm long. This base has been deliberately cut off the rest of the hook, by cutting a groove right round and snapping through the weakened section. This is not the only fish hook fragment on the site which has been treated this way: the "chopped" base of a hook was recovered from Square K4 on the interface of Layers 2 and 3. The similarity in practice suggests that the piece from G4 is derived from early Layer 2 rather than Layer 4. The third fragment from this square (Z2184) is the mid-section of a fish hook

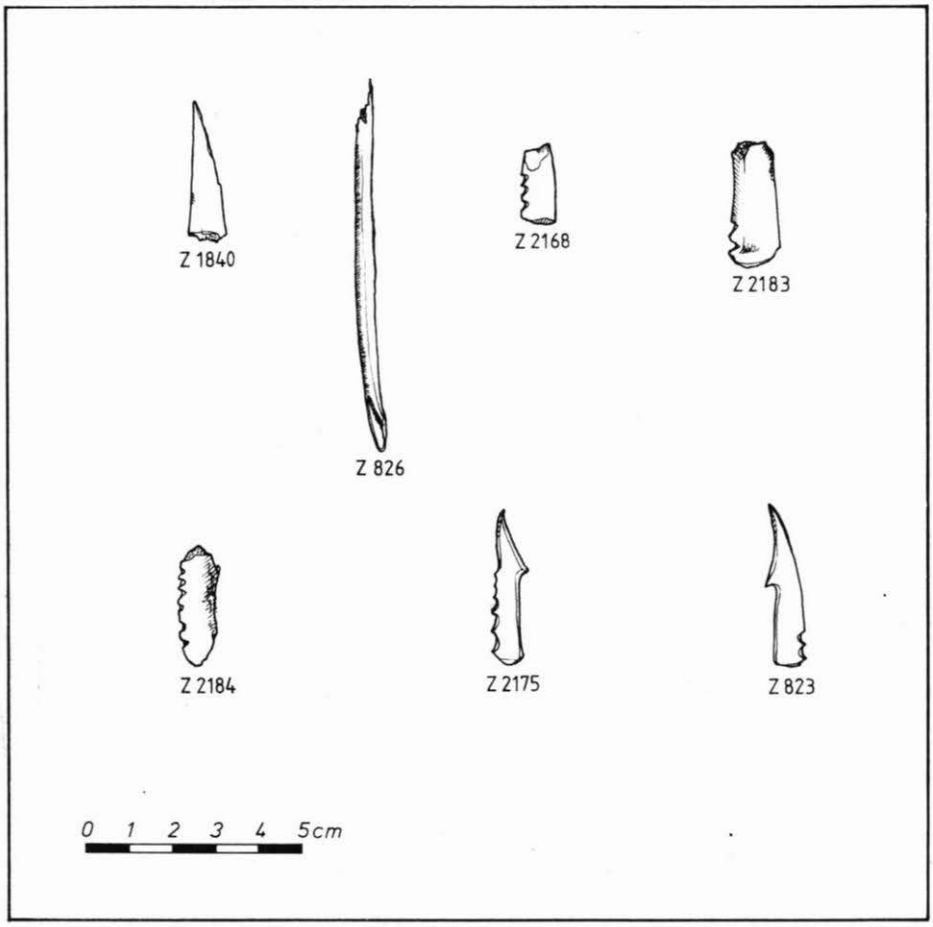

Figure 7: Bone artefacts from Layer 3, S164/20.

point bearing six prominent notches on the outside curve and a small notch on the underside of a dog-leg corner. The arrangement of the facets on the bone sugcests that this was a barracouta point made from a dog mandible.

From Square F5 a complete, straight, composite fish hook point (Z2175) was recovered, made from a fragment of wing bone (?*Diomedea* sp.). It has two lashing notches and three smaller notches cut above them. The barb is on the opposite surface and the line between the point tip and the point of the barb is slightly concave. Another complete composite hook (Z823) made in bird bone has only two lashing notches but the barb area is very similar. This piece was recovered from the top of Layer 3 in Square E3.

STONE ARTEFACTS

Only 66 flakes were recovered from Layer 3 and of these 10 show traces of use damage. They cover much the same range of rock types as Layer 4 and fewer than the much larger assemblage from Layer 2.

The few utilised flakes from Layer 3 have sections of edge damage ranging from

small, concave, steep-angle notches, between 0.3 and 0.7cm across, to medium or steep-angle sections, both straight and concave, about 1.0cm long, and finally larger medium-angle straight sections around 2.0cm long. All were damaged on one side only and they fit into the category of "scraper".

It is tempting to ascribe the green and grey-brown volcanic rock chips to Layer 4 since the square in which they were concentrated (D1) had 11 such chips in Layer 4 and none in Layer 2. Similarly the schist fragment came from a square (F3) adjacent to squares in which schist was found in Layer 4. As yet no true schists have been identified from Layer 2. In contrast, the flake of brown lustrous porcellanite cannot be matched in Layer 4 but is very similar to several pieces in Layer 2.

TABLE 2

STONE ITEMS FROM LAYER 3

	Waste Flakes	Used Flakes & Artefacts
Obsidian – green	6	–
Silcrete	3	1
Chalcedony	11	4
Green chalcedony	2	1
"Crazed" chalcedony	2	–
Non-lustrous porcellanite		
– white	4	2
– grey	1	–
Lustrous porcellanite		
– red-brown	1	–
Chert – yellow	–	1
– grey	–	1
"Volcanic" – green	17	–
– grey-brown	7 plus 1 cutter frag.	–
Schist	1	–
	55	10

THE ARTEFACTS FROM LAYER 2

INTRODUCTION

As the most recent evidence of prehistoric occupation of this site, the Classic Maori deposit was subjected to disturbances from European farming operations and fossickers and might be expected to have been so seriously affected that meaningful activity areas would not be recognisable. Fortunately most of the deposit was thick with fishbone and ash which protected many delicate bone artefacts and deterred the fossickers. Having recognised the remains of a house on the western edge of this site (Squares A1–5, B1–5, C1–5), the curio hunters had concentrated on the interior which from experience they knew to be rich in artefacts, especially of nephrite. As soon as they encountered the burnt wall posts they ceased operations in this location. Thus the remains of all the activities which were carried out to the east of the house have been found *in situ*, and there is evidence of only minor erosion of material from the top of the deposit before it was covered by vegetation and a top soil developed.

BONE AND IVORY ARTEFACTS

(a) Personal Ornaments

Three teeth, obviously from the same comb, were recovered from two adjoining squares in the southeast corner of the excavation (J4–Z1843, 1 tooth; K5–Z1844, 2 teeth). They vary in length from 4.99 to 5.02cm, in width from 0.31 to 0.34cm, and in thickness from 0.25 to 0.28cm. In cross section they show flattened front and back surfaces and convex sides (Fig. 8). The bone from which they have been made is very dense and glossy and is reminiscent of human bone, from which some other Murihiku combs

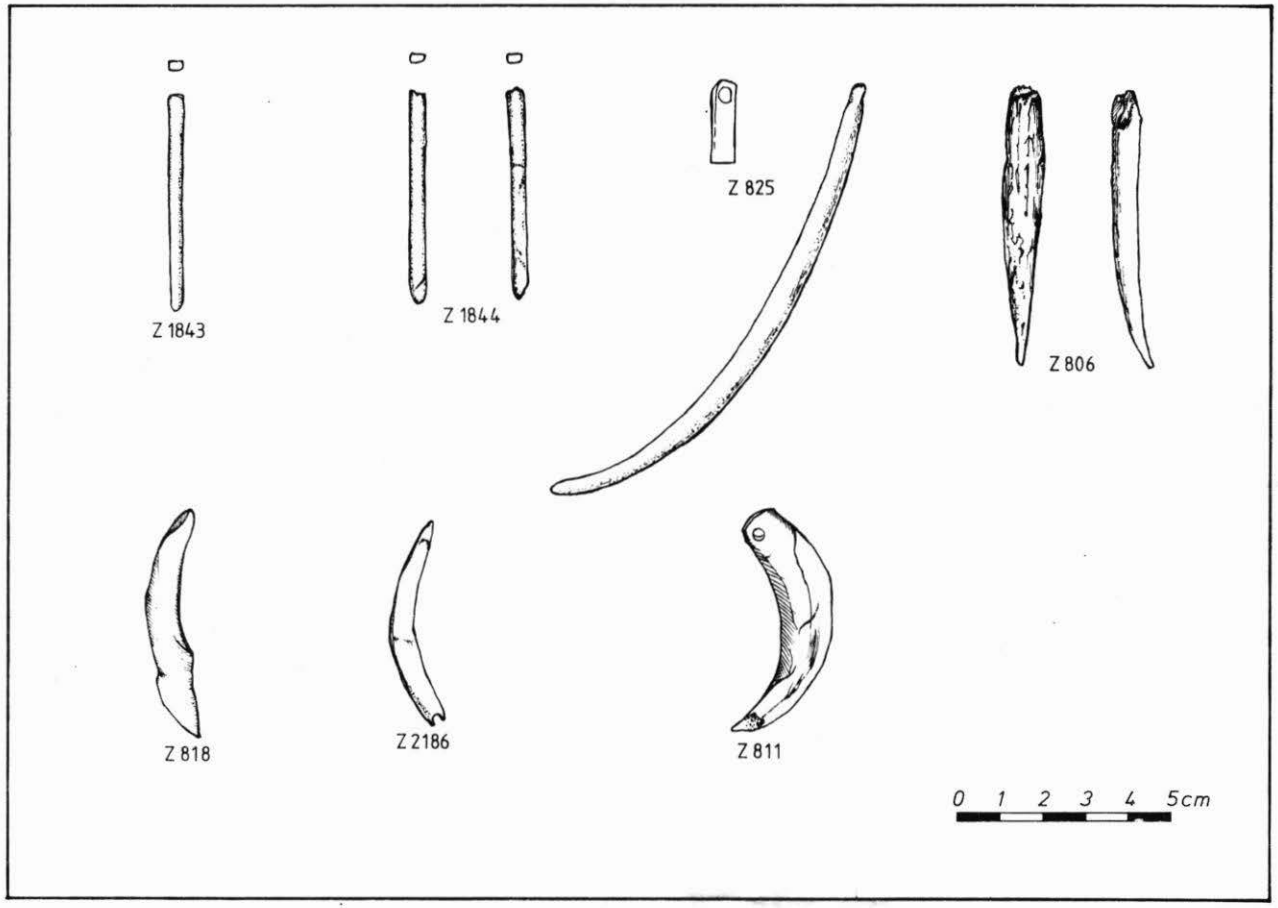

Figure 8: Bone artefacts from Layer 2, S164/20: teeth from a comb and pendants.

are believed to have been made. The dimensions of these teeth closely match one recovered from a Classic Maori site on Taiaroa Head at the entrance to Otago Harbour, dated to the mid-18th century and said to have been founded a century before (H. Leach and Hamel 1978:245–6). The tooth form suggests that these broke off a flat comb, a type which was described from the upper layers at Little Papanui (Simmons 1967:Fig. 25). The Otago Museum has three combs and three comb fragments collected from the Long Beach area, including one found with a crouched burial. Although not found in quantity, possibly because of a tendency to split or break into small unrecognisable fragments, bone combs occur on most Classic Maori sites in East Otago but have not been recovered from even Late Archaic layers.

A complete curved bone pendant 12cm long found in Square G3 (Z825) has been drilled for suspension at one end and comes to a blunt point at the other (Fig. 8). It is a typical example of a cloak pin (Teviotdale 1939), also called a mat pin (Simmons 1967:53, Fig. 25). These have been found before at Long Beach, Murdering Beach and Kaikais Beach, at Tarewai Point and in the upper layers at Little Papanui and Kings Rock (Lockerbie 1940:Fig. 14, 402). Like the bone combs they appear to be restricted to Classic Maori sites in Otago. Although the Kings Rock specimen was manufactured in moa bone, this example is probably of human bone.

Another curved bone point from Square K4 (Z806) displays less curvature than a cloak pin and is wider. While the front surface is flat (transversely) and smooth, the back is convex and shows rough cancellous bone. The point is 6.5cm long and since the top portion is missing it cannot be stated with certainty whether this was drilled and whether it is, in fact, a pendant. It is possibly an unfinished example.

One of the most interesting unfinished pendants (Fig. 8) was an undrilled 'kinked' pendant reminiscent of a human leg found in Square F2 (Z818). It is probably made from the canine of a fur seal which has been split and then filed diagonally on both sides. The "knee" has been formed by abrasion above and below the projection and on the opposite side. In his study of Maori neck and ear ornaments of the 1770s, Orchiston (1972:102) wrote that this form has "a predominantly if not exclusive South Island distribution" and that "it is not impossible that the 'kinked' pendant is entirely a post-contact phenomenon". Before this example was found in a dated prehistoric deposit, such pendants had been collected from the upper layers at Little Papanui, from Kaikai and Murdering Beach and several other Classic Maori sites in Otago. There can be little doubt remaining that this is a prehistoric artefact style. It was also found at Paeroa Pa in the Bay of Islands (seen by H.M.L.) with three groups of two to three fine serrations on the "knee", "calf" and "ankle".

Another sliver of split seal tooth (4.7cm long) had been highly polished and drilled for use as a pendant (Z2186). This was found, with the perforations broken through, in Square G2 adjacent to the square in which the 'kinked' pendant occurred. Possibly this was discarded at the time of manufacture when the drill point broke off the top, rather than after prolonged use. Seal teeth were commonly modified into barracouta points but a few worked slivers of seal ivory may testify to the use of pieces which were not substantial enough to use as hooks.

In the light of these finds of worked seal tooth pieces, it was surprising to discover in Square D5 a whole tooth (Z810) drilled through into the pulp cavity. Whole teeth worn as pendants are characteristic of Archaic sites in many parts of New Zealand, and in Otago four perforated seals' teeth have been found at Shag River, three in the bottom layers at Little Papanui and 39 from the "lower layer" at Kaikais Beach. Two were found at Wairau Bar. Onepoto is the only other site in Murihiku where this artefact type has been associated with Classic Maori artefacts such as greenstone pendants (Simmons 1973: Table 12). The possibility that the Long Beach example was originally deposited in an Archaic layer must be considered before recording this as a second Classic Maori occurrence. The layer accession of Z810 is given as Layer 2/3, implying that it was found just below the midden-rich, Classic Maori layer. This square had only a thin covering of Layer 3 sand and was adjacent to a large post hole in C5 from which the post had been removed. It is possible that the pendant

was brought up from the Archaic deposit when the post hole was dug or when the post was pulled out. The tooth was identified as the left mandibular canine of the New Zealand fur seal *Arctocephalus forsteri* (I. Smith: pers. comm.). It had been considerably reduced along the inside curve by filing, thereby achieving a more gracile appearance.

(b) Fishing Gear

As might be expected from the presence of large quantities of barracouta bones in the midden (R. Fyfe: pers. comm.) "barracouta" points were recovered from several squares (Fig. 9). These are trolling lure points of several types. There were two plain point tips, one possibly made from the canine of a dog (Z808, from Square H2) and one more robust point of bone (Z1841, from Square K2), as well as a section of a plain point made from a dog mandible (Z2185, from Square F3). The tips may have been from the slender curved type A.1 (c.f. Hjarno 1967:17), but the dog mandible point displays the characteristic width of the lugged or dog-leg type A.3 which is not always serrated. Another base section from Square K5 (Z2699) is serrated and robust, but has no lug and is not obviously dog-legged (Fig. 9). It too was made from a dog mandible.

There are two examples of the more elaborate serrated A.3 lure points. From Square H2 a seal tooth ivory barracouta point was recovered in perfect condition (Z821). It has a drilled base, a plain lug and a finely serrated area on the outside curve immediately behind the tip. It is similar to examples in the Otago Museum collections from Long Beach (Hjarno 1967: Plate XIII) and to a hook found at Huriawa A (Karitane No. 1240). The point (Z2171) from Square H4 consists of the tip and body of the lure point including a well made lug. The base, which would have been inserted into the wooden shank, has been broken off, almost certainly at the spot where the hook emerged from the shank. The external edge has been serrated from immediately behind the tip to just above the lug. The serrations are close together near the tip and spaced out towards the lug. The hook may have been made from seal bone. Hjarno (1967:18) noted that the lug sometimes took the form of a stylised human head and there is a hint of this feature here.

Four complete points of composite bait hooks (Fig. 9) were obtained from the same general area of fish midden as the lure hook points. From Square F2 a small point with damaged base (Z820) was found, probably made of human bone. It has two large lashing notches on the outer edge and a slight internal barb. Both the inner surface of the tip and the outer edge have been slightly serrated with broad, shallow and subsequently smoothed "bites". It should be classified as intermediate between Type C.3 and C.4 in Hjarno's classification (1967:27–9) for it is simpler than the C.4 type, yet fully serrated. It can be matched closely in the Huriawa A assemblage. At the opposite extreme are the fine serrations on a moa (?) bone hook found in Square J3. This intact straight point (Z819) has a simple internal barb, a single broad lashing notch and 14 fine cuts on a 1.3cm length of the outside edge immediately above the lashing notch. The cuts are so fine that they must have been made by a small flake of chalcedony or porcellanite. The only metal tool which could achieve this effect would be a razor. The composite bait hook point recovered from Square H3 (Z2176) has both internal and external barbs, two lashing notches, and fine serrations on both sides of the tip above the barbs. It is possibly made of moa bone and it curves in slightly at the tip with the internal barb slightly lower than the external one. From the neighbouring square, G4, a smaller hook was found (Z2173), also presumed to be of moa bone. It displays a conventional internal barb and on the outer edge, immediately above three lashing notches, is an external barb set much lower than the inner one. As in the previous hook (Z2176), the whole tip area above the barbs is covered with fine serrations. These hooks find parallels in other collections from Long Beach and Murdering Beach, but in no way approach the multi-barbed, serrated examples referred to by Hjarno (1967:29) as "baroque". In addition to these four complete hooks, the base of a very large composite hook point (Z1839) was found in Square K4 at

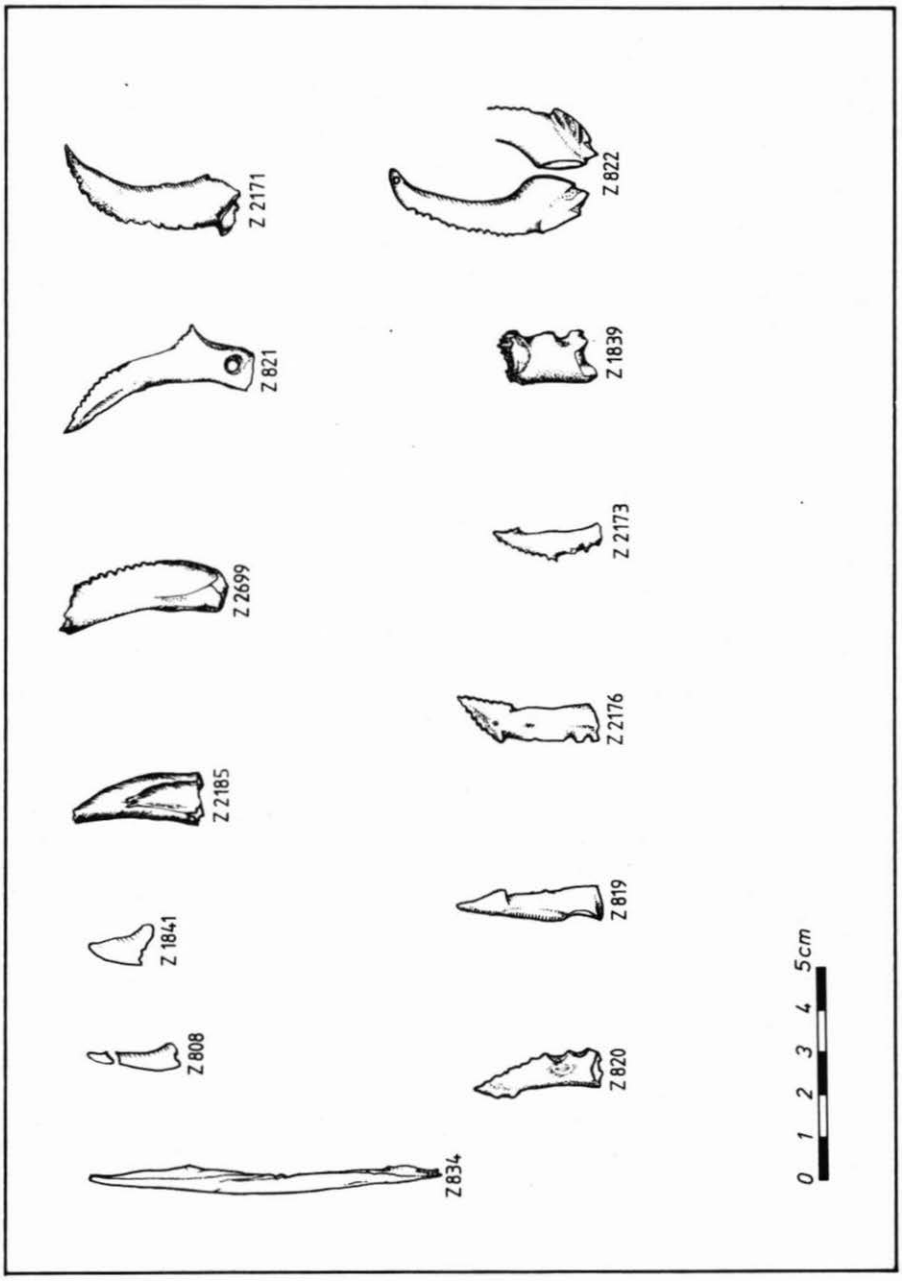

Figure 9: Fish hooks from Layer 2, S164/20.

the base of Layer 2. Made from moa bone it shows two lashing notches on the side and an unusual notch of similar size cut into the base itself. This hook base has been deliberately chopped off the rest of the hook (c.f. Z2183, Fig. 7).

The most unusual hook in this collection is an unbarbed, serrated, composite bait hook point with a large basal knob (Z822, from Square K3). The tip curves in slightly and below the tip the outer edge is finely serrated down to the knob. This knob is grooved virtually right around its base and has at least four more grooves over the face. Its function may be that of a bait knob which would prevent the bait from slipping off the hook presumably through providing an anchor for the cord securing the bait. Alternatively the grooved knob may have been designed to secure the lashings of the hook point to the shank. This explanation may be more appropriate, for bait knobs are a feature of one-piece rather than composite fish hooks. This hook was made from dense, glossy bone (?human), and there is no evidence that it was originally a one-piece hook (c.f. Hjarno 1967:Fig. 26) which had split and been reworked. Nevertheless it shares both the knob feature and the serrations with Hjarno's Type D.1.b. of which there are only two examples from Otago, both from what are believed to be Classic Maori contexts. The fine serrations on this hook would look quite out of place in an Archaic assemblage.

One split fish gorge (Z834) was recovered from Square E2. Made from a large bird bone it is 8.3cm long, pointed at each end and drilled in the centre. Since the fracture runs through the perforation it is possible that this broke during manufacture. The Otago Museum has at least 11 similar gorges collected from Long Beach, and Simmons (1967:26–32) notes the presence of 38 notched or grooved gorges from all layers at Little Papanui but none are described from Kings Rock. There is a need for more research into the function of this artefact type and the distribution and significance of the cord attachment devices.

(c) Bird Spears

From a test pit in Square A5 was recovered the base of a bird spear (Fig. 10) made from a shaft fragment of bird bone (Z845). It has split longitudinally from just above the first barb to the base which has also been fractured transversely. A well-shaped pointed base (Z827) which is morphologically identical to many bird spear bases was found in Square C5 at the base of Layer 2. It too was made from bird limb bone, and shows longitudinal fractures. The crescentic cross-section of both pieces is considered by B. F. Leach (1979:107) to be stronger than the solid oval type which was represented by the Layer 3 example.

(d) Incised Diomedea Bones

Toggles and flutes made froi the wing bones of *Diomedea* species are common in Classic Maori sites of Murihiku (Simmons 1973: Table 12; H. M. Leach and Hamel 1978:249) and also occur in Canterbury (Thacker 1961). They are often decorated with groups of incised lines, cut at an angle, forming diamond or lattice patterns. Except where more than one drilled hole is evident, it cannot be determined in the case of fragments which artefact is involved. The toggle has a single hole in the centre, and the flute has three to four (Trotter 1967:Fig. 4), but they are seldom found complete. Two incised fragments were found in this excavation (Z2189 from Square H1; Z1842 from a test pit in B4). The former (Fig. 10) is deeply incised with two groups of seven grooves meeting at an angle of 55°. The latter has three grooves and two fine incisions and has been burnt and fractured in the fire that destroyed the house.

(e) Worked Bone

In concentrating on recognisable artefact forms such as fish hooks, bird spears or pendants, archaeologists have not developed classifications or undertaken functional studies of various simple but distinctive types of bone point (with the exception of awls, c.f. Cave 1976). Indeed these may not be discussed in reports or only briefly

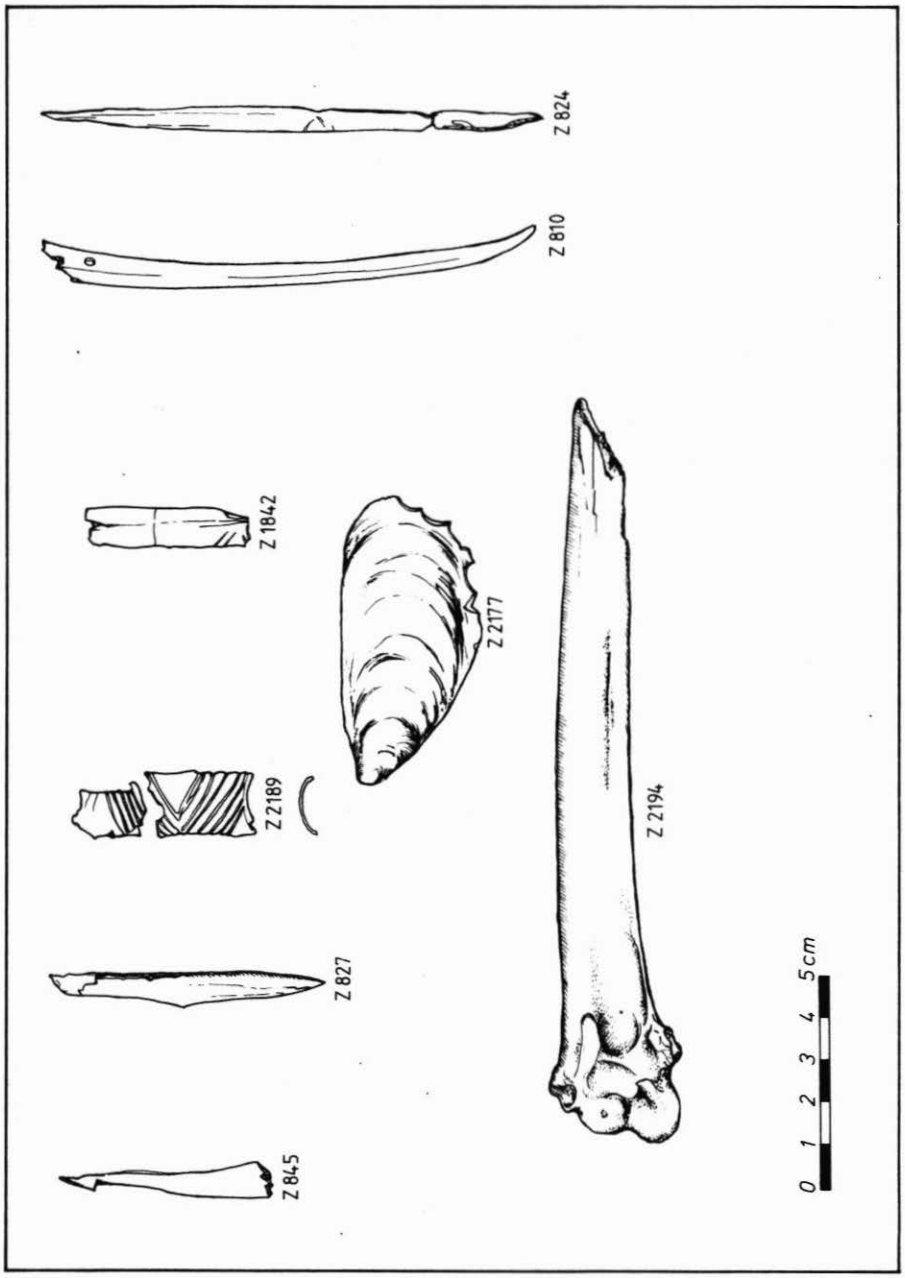

Figure 10: Points and worked bone and shell from Layer 2, S164/20.

referred to as "bone points". Simmons (1967:Fig. 14, 20), however, referred to and figured objects which he called "threaders" which are pointed bones of sea birds with needle-like perforations at the upper end. At Long Beach, there was a "threader", 11.7cm long, made from the shaft of a bird wing bone (Z810 from Square J4). It had been ground to an asymmetrical point (Fig. 10) and may have been used to thread flax cord through the gills or eyes of fish for transportation.

A double-ended point, also 11.7cm long, with a notch cut around it 2.5cm from one end, was found in Square E3 (Z824). This is very similar to one figured by Simmons (1967:Fig. 14), and would be interpreted by him as a tine or point for a fishing spear or even for a composite comb (Simmons 1967:20). The important point is not whether these are spear points or threaders, but that they are distinctive types which can be expected to appear on other sites and deserve closer study.

Several fragments of bone points were also found: from H5 a dog bone worked to a blunt point (Z2174) and too wide to use as an awl or needle; from E3 a triangular-sectioned bone with a carefully faceted and rounded end (Z2190); from G3 a filed bone fragment (Z2181); and from B2 a grooved and cut sliver of bird bone (Z831).

Considering the number of *Diomedea* bone artefacts made from long shafts it is not surprising that proximal and distal ends of wing bones were also found, with characteristic sawn grooves. Two examples were obtained from G2 (Z832) and H5 (Z2687). The first is the distal end of the left humerus of the albatross *Diomedea epomophora* and the second is the proximal end of the right humerus of a mollymawk *Diomedea cauta*. Both have been scarfed from two sides and then snapped. A large bone point (16cm long), found in Square F4 (Fig. 10), was also made from a *Diomedea* wing bone (Z2194), and uses the distal end of the bone as a "handle". Since it far exceeds the longest point which Cave (1976) classed as an awl (10cm), it should perhaps be allied with Simmons' (1967:20) category of "pickers", of uncertain function.

Human bone was also used in artefact manufacture. The proximal end of a left radius was found in Square G4 with the epiphysis broken off and the shaft end filed and then sawn from both sides (Z830). Another shaft piece of human limb bone (Z2169 from Square F1) had been sawn, snapped and ground smooth on one end. It had been chopped to a point (probably with an adze) at the other. A tiny fragment from G4 (Z2172) also showed the marks of sawing and snapping, as well as some tentative cuts above the main groove which may have occurred when the saw was being "centred".

Two bone objects froi Squares F2 and F3 complete the bone assemblages: Z833 is a thick bone tab, possibly of moa which has been split and filed before being discarded close to a fire and charred; Z2191 is a piece of immature seal bone which has been chopped to a rough point, probably with an adze.

SHELL ARTEFACTS

A mussel shell with a series of deep "bites" (Z2177) was found in Square F3 (Fig. 10). The fractures were not fresh and the function of the artefact (if other than accidentally broken) would have been as a "saw" or "peeler" rather than a scraper, the traditional role of the mussel shell. In the same square the top valve of a *Myadora striata* shellfish (Z1837) showed abrasive wear on its edges and high points. This may have been received on a beach rather than in use, and the shell may have been brought to the site to be drilled as a pendant. Destruction of the hinge area means that this will never be known for sure. An important find from Square G5 was a paua shell disk, 1.64cm in diameter, without a central perforation (Z816). This was probably intended for use as an eye piece in a wooden carving. Trotter (1967:242–3) found a larger drilled eye piece of oval shape at Katiki Point, and Teviotdale (1939) noted one from Tarewai Point. At Little Papanui two paua shell rings were obtained from the top layer (Simmons 1967:53). Although uncommon in the literature the eye piece appears to be diagnostic of Classic Maori culture in Murihiku. Two undated paua eye pieces recovered at Long Beach were added to the Otago Museum collections in 1920 and 1932, and it is likely that others were found at Murdering Beach.

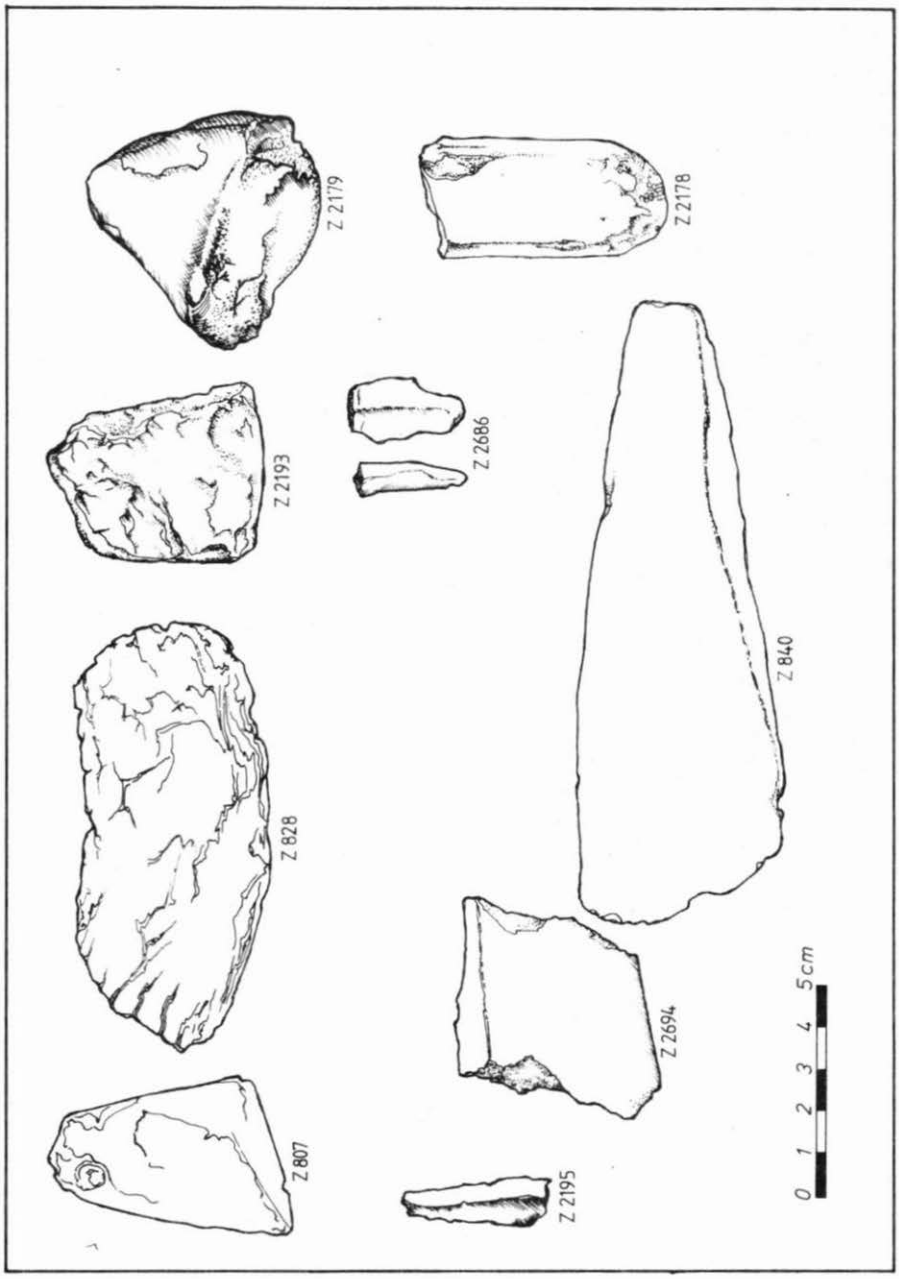

Figure 11: Stone artefacts from Layer 2, S164/20.

STONE ARTEFACTS

(a) Nephrite Artefacts and Fragments

The three beaches north of Otago Heads (Long Beach, Murdering Beach and Kaikai Beach) are well known for the quantity of nephrite fossicked from them (H. Leach 1972). The 1977 excavation at Long Beach was fortunate that it encountered undisturbed stratigraphy and an interesting collection of nephrite artefacts and associated industrial materials. In Square G1 an important amulet form (Fig. 11) was found in an unfinished condition (Z807). This piece is adze-shaped, with a skew edge and a partly drilled eye-like hole close to the butt end. The nephrite is grey-green in colour with pale brown impurities (?Wakatipu source) and it has been only partially polished. The skew edged amulets described by Skinner (1974:91) are either scarfed or drilled with small steep-sided holes, whereas this artefact has the type of depression often seen in a *tiki*. A hollow close to the right-hand edge at the same level as the "eye" may represent an attempt at a similar feature. Perhaps the most suitable word to apply to this artefact is Skinner's (1974:46) term "hybrid". It should be noted that adze pendants are also restricted to Classic Maori sites (Simmons 1973: Table 12). A fragmentary pendant in the form of a chisel (Z2695 from Square G4) is reminiscent of several described by Skinner (1974:92). Made in dark green nephrite, it has a flat end, 0.1cm thick, instead of a bevel.

The largest nephrite artefact (Z828 from Square F2) is a rough adze-shaped piece (9.9cm long) with the same grey-green colouring as the adze amulet. The most significant attribute of this piece is that it has been flaked into shape and shows signs of battering on its high points. No part of it has been ground or sawn, which are the normal techniques used to shape nephrite artefacts. Greenstone working in the Archaic site of Heaphy River was entirely restricted to flaking and hammer dressing, and these techniques are evident in the Otago Museum collection from a "village" near the Wakatipu source. Dawson's (1949: Plate 1) illustration of the burial adze found with the one-piece fish hooks at Long Beach also suggests shaping by flaking. We may be dealing with the survival of the earlier techniques into Classic Maori sites where they co-exist with grinding and sawing. Alternatively this piece may have been excavated by the Maori occupants themselves. Against this view is the presence of flakes and slivers of nephrite throughout the Classic Maori deposit, indicative of the use of hammers. These fragments often have polished or partly polished faces indicating that they may be the result of reworking broken adzes or gouges. Sometimes, however, they are unpolished. The largest recognisable adze fragment was found in Square G1 (Z815) and is partly polished front and back with rough edges. One portion is slightly hollow-ground. This piece is of dark-green nephrite which is less common on the site than the pale grey-green variety. In all, 22 nephrite items were found in 11 squares. Fifteen were grey-green in colour and the remaining seven were dark-green. Only four fragments plus the flaked adze (?preform) bore no traces of polish.

(b) Sandstone Grinders

A variety of shapes are evident in the sandstone grinders from this site. Two are roughly quadrilateral in cross-section and are tapered like adzes, but one margin is completely rounded while the opposite side is flat. Thus the front and back surfaces curve to meet each other along one edge. These examples are from Squares G1 (Z2694) and K3 (Z840), and they are made from fine-grained material (Fig. 11). Much coarser sandstone is represented by a fragment from E1 which has ground surfaces both front and back (Z2196). A small triangular-section grinder found in Square G2 (Z2180) has only one slightly hollow-ground surface and is made of extremely fine-grained sandstone. An interesting example of a triangular-shaped grinder was recovered from Square K4 (Z2688). Its ground edges which come to a point are not flat but undulating, and the conclusion is inescapable that this tool was rubbed against the object being ground, not vice versa. Another pointed grinder was found in Square H2.

(c) Hard Cutters

These are made from spalls struck from water-worn boulders of hard volcanic rocks or schistose greywacke. They have bevelled edges as a result of being dragged to and fro in a groove, presumably in another hard rock such as nephrite. Examples were found in Squares G1 (Z2690, Z2691), F1 (Z2683), and a three edged cutter (Fig. 11) was found between Layers 2 and 3 in Square C5 (Z2193).

(d) Other Industrial Tools

Only one possible hammerstone was recovered (Square C1, Fig. 11). This was a broken, elongated, water-worn stone with a small amount of bruising on the intact end consistent with use as a small knapping hammer (Z2178). Another water-worn stone from Square G4 (Z2179) had split along a natural plane and the fracture surface was extensively ground over the high points. The type and distribution of wear suggests that the ground surface was rubbed over a flat slab, perhaps to pulverise ochre although no traces of this material are detectable on the artefact. Ochre is abundant in most squares in the site.

A very small burnt fragment (Z2689) of a hard rock such as basalt or greywacke, from a test pit in B3, displayed a fully ground surface curving round to meet another ground face. The edge was also curved longitudinally, and the shape was reminiscent of a small patu or beater. Unfortunately the portion was too small to be sure of this identification.

Three stone drills found in Square F3 (Z2684, Z2685) and G2 (Z2686) were small, and were made from silcrete, chalcedony and red-brown porcellanite respectively. Only one was extremely worn (to the point of rejection), and it must be concluded that this type of drill which is traditionally associated with the manufacture of fish-hooks or wooden artefacts (H. Leach 1979) was not in much demand on this part of the site.

If one excludes nephrite fragments and the rock types used for grinders and cutters, the flaked stone assemblage (Table 3) consists of 591 items of which 109 flakes and three drills show clear signs of edge damage consistent with use. The overall ratio of unused to used flakes indicates a higher proportion of waste flakes (4.5:1) at this site than at the working floor at the Washpool Walls (Wairarapa) which was subjected to the same type of analysis (H. M. Leach 1979). It gave a ratio of 1.96:1. It would be unwise to make too much of this difference, because the Long Beach assemblage is dominated by chalcedony in various forms, followed by silcrete and non-lustrous porcellanite, materials which are all but absent from the Washpool Walls. Indeed, examining the ratios from Long Beach for chert and obsidian (the dominant materials at the Washpool Walls) which are 2.5:1 and 0.68:1 respectively, diminishes the significance of the difference. It is suspected that chalcedony is rather more resistant to edge damage than the other materials and that edge damage in silcrete is more difficult to recognise. Both factors work together to inflate the number of apparently waste flakes in the assemblage. Individual ratios for chalcedony are 7.5:1 and for silcrete 3.93:1.

The same problem besets the analysis of the number of utilised edge sections on each flake. At the Washpool site the overall average was 2.45, and at Long Beach it is only 1.87 ($n = 107$). However, where definite edge damage has been identified and measured, the lengths of the damaged sections can be compared. When plotted on a histogram, the Long Beach examples peak at 0.5cm, and all but 15 of the 200 edge sections fall within the range 0.2 – 1.2cm, comparable to the Washpool Walls flakes. As at the Washpool, the majority of utilised edge sections are concave, of medium to steep edge angle (50–90°), and almost all have unifacial damage, a combination of features attributed to the effects of scraping.

The range of materials is very similar to that described from Layer 4 except for the appearance in Layer 2 of lustrous porcellanites (in various shades of red-brown

TABLE 3

FLAKED STONE FROM LAYER 2

	Waste Flakes	Used Flakes
Obsidian – grey	3	9
– green	10	10
Silcrete	59	14 plus 1 drill
Chalcedony	189	32 plus 1 drill
Green chalcedony	77	8
"Crazed" chalcedony	34	–
Non-lustrous porcellanite		
– white	16	5
– other colours	15	4
Lustrous porcellanite		
– red-brown	12	7 plus 1 drill
– purple-grey	8	5
Chert – yellow	8	5
– grey	17	5
Opalline jasper	2	–
"Volcanic" – green	14	1
– grey-brown	3	–
Argillite (?D'Urville Is)	–	1
Pitchstone	–	2
Metaquartzite	1	–
Black ?silcrete	2	1
Burnt unrecognisable	9	–
	479	112

and purple-grey) and a white form of non-lustrous porcellanite. The lustrous porcellanites, which were formed in parts of Central Otago and Southland when coal measures caught fire and baked surrounding sediments (G. Mason: pers. comm.), were utilised by the Archaic occupants of South Otago and other early sites in North Otago, so their absence from Layer 4 at Long Beach must be attributed to small sample size. The white porcellanite, however, which is thought to have come from Moeraki, is common only in Classic Maori sites. The other important Moeraki material, chalcedony, was well represented in both Layer 2 and 4. Until definitive studies can be made of these flake materials and their sources, any conclusions based on their distribution and availability must remain weak.

European artefacts consisted of iron nails 5.0 – 7.5cm long (including two horse-shoe nails), fencing wire, numerous cartridge cases, mostly of .22 gauge, fragments of both curved clear bottle glass and flat sheet glass, a few small fragments of a blue and white china plate and a small wooden and iron penknife. These materials were widely scattered throughout the turf layer and in the upper parts of Layer 2. The flat glass, china and bottle glass suggest the presence nearby of a 19th or 20th century dwelling. The cartridges are most probably the result of rabbit shooting in the first half of this century. In the loose sandy soil of the site on which the grass cover is easily denuded by European farming or over-population by rabbits, it was not surprising to find European artefacts within the top half of Layer 2.

ACTIVITY AREAS IN LAYER 2

The house wall identified from four substantial slab posts, one post hole and one stake, which lie north-south along the C line of squares, coincided closely with the margin of the fossicking. The size, shape, and spacing of the posts (88–94cm apart) places them in the category of house timbers rather than palisade posts, and the interest shown by the curio-hunters in what they enclosed supports this view, for the fossickers' "great ambition was to strike a fireplace. He knew then that he was in the centre

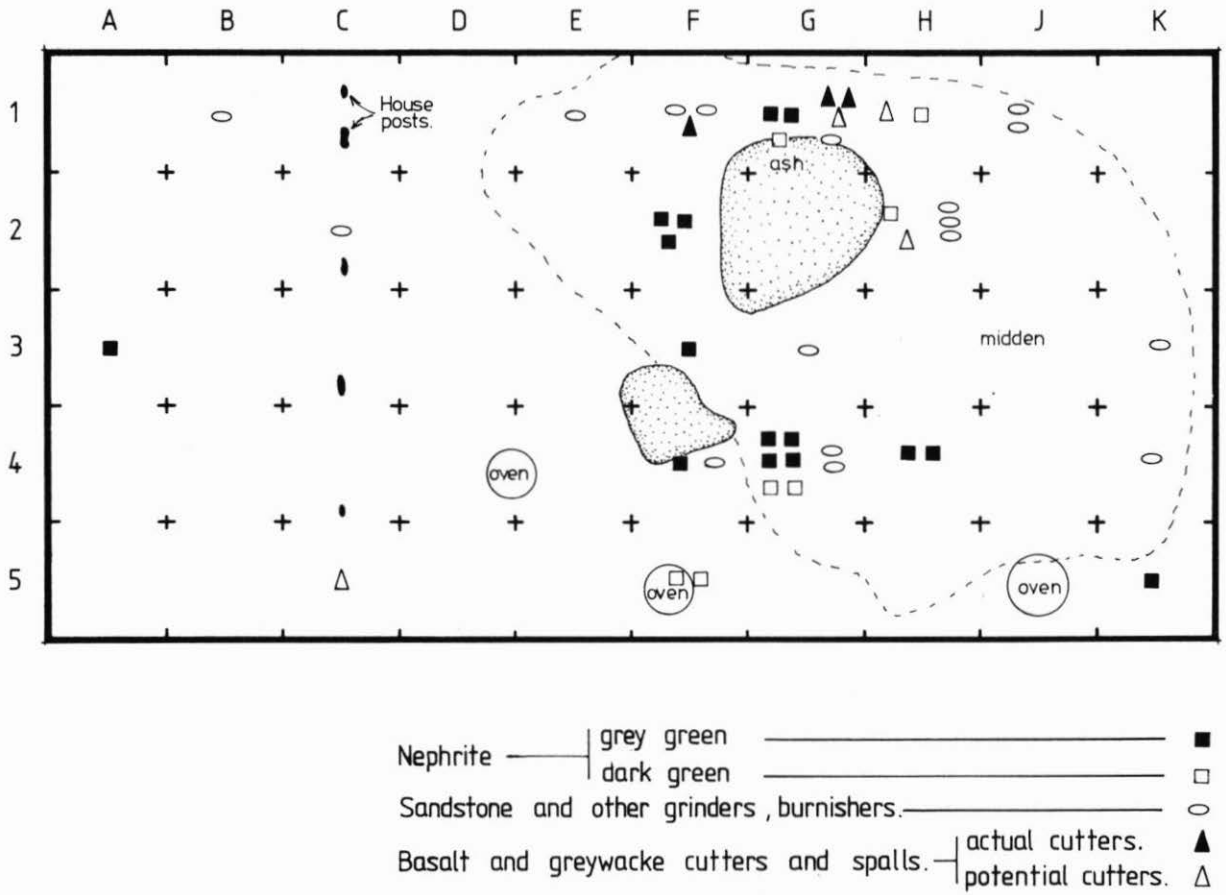

Figure 12: Distribution of nephrite, sandstone, and greywacke and basalt spalls in Layer 2, S164/20.

of a whare and that he should work outward to the walls where the Maori in most instances kept his valuables" (Thomson 1944:51).

The fossickers left behind them a jumbled mass of reddened sand and ash and numerous small flakes. In the one B line square which was fully excavated (B1), the highest total per square of flakes was recorded for the whole site (63) and these included obsidian, silcrete, chalcedony, chert, and lustrous porcellanites. All were damaged by heat to some degree and it was difficult to assess how many had been used and suffered edge damage. Needless to say, no nephrite or bone artefacts were found in these fossicked squares.

To the east of the house a broad strip of fish bone and shell midden occupied the higher portion of the site overlooking two oven pits (Fig. 2) and sloped down towards the southeast corner where it overlay a third. One large and another smaller patch of ash formed lenses within this midden. When the distribution of the flaked stone and stone and bone artefacts was plotted, it was found that several artefact types were clustered around these lenses of ash. The most striking example is the concentration of fragments of worked nephrite (both grey-green and dark-green types), along with sandstone grinders and abraders made of other rocks, and basalt and greywacke cutters and unworked spalls (Fig. 12). This pattern suggests that the high ground not only served for dumping rubbish but was also used for at least one period as an open-air workshop where greenstone was cut and polished. The ash was derived from the burning of firewood, presumably to keep the workers warm, and the large quantity which remained indicates that many logs were consumed. It is possible too that the fire had an industrial purpose (Beck n.d.), although there are no signs of heating on the nephrite or other materials. The presence of unused spalls might argue that this was not a temporary working floor but one that was established long enough for a few tools to be "stockpiled" ready for use.

The question whether this was solely a greenstone workers' area must also be considered. The distribution of fishing gear (Fig. 13) while overlapping the ash lens area, extends several metres beyond it and appears to be more closely associated with the fish bone midden. Three of the five bone pendants are close to the ash lenses as are the three drill points. Again, three of the four incised *Diomedea* fragments (toggles or flutes) lay within a metre of the ash lenses. Most of the worked bone or ivory fell in the same area. Exceptions include the possible fish threader and the comb teeth which lay within the area of fishing gear. Although the pattern is not as sharp as in the case of greenstone working, it would appear that some bone working took place in this workshop as well, especially the manufacture of items from *Diomedea* bones.

Flaked stone (not including nephrite or spall cutters) is concentrated in two locations (Fig. 14), the house and the northern end of the H line of squares. In the latter position it overlaps with the eastern edge of the greenstone workshop, but its distribution pattern is sufficiently different for us to say that the operations carried out in the workshop did not require large quantities of small flake scrapers or incisers. If they are associated with any particular recoverable component other than the house, it is with the midden. The distribution of the various stone types (Fig. 15) is particularly interesting for it gives the strong impression that the flakes were struck and used (or rejected) in specific areas to which the parent core had been brought. In the case of grey obsidian, all but one of the flakes fell in the northwest corner of the site and were most numerous in the few house squares that were excavated. Of the 20 green obsidian flakes, 17 (85%) were found in the southern and southwestern squares. The white, non-lustrous porcellanite was clustered (66%) in a few squares on the northern edge of the excavation, while lustrous porcellanites were restricted to the house and a strip adjacent to the white porcellanite. These examples of nearly exclusive distributions within a site strongly support the view that cores were taken to the scene of a particular operation and were reduced on the spot to provide appropriate working edges for the task in hand. Of course this can be demonstrated only in the case of relatively rare stone types, but there is every reason to expect that it applies to the abundant chalcedonies and silcrete. In this site it also reveals that the midden dump (including the ovens) and its adjacent squares served as an industrial area as well.

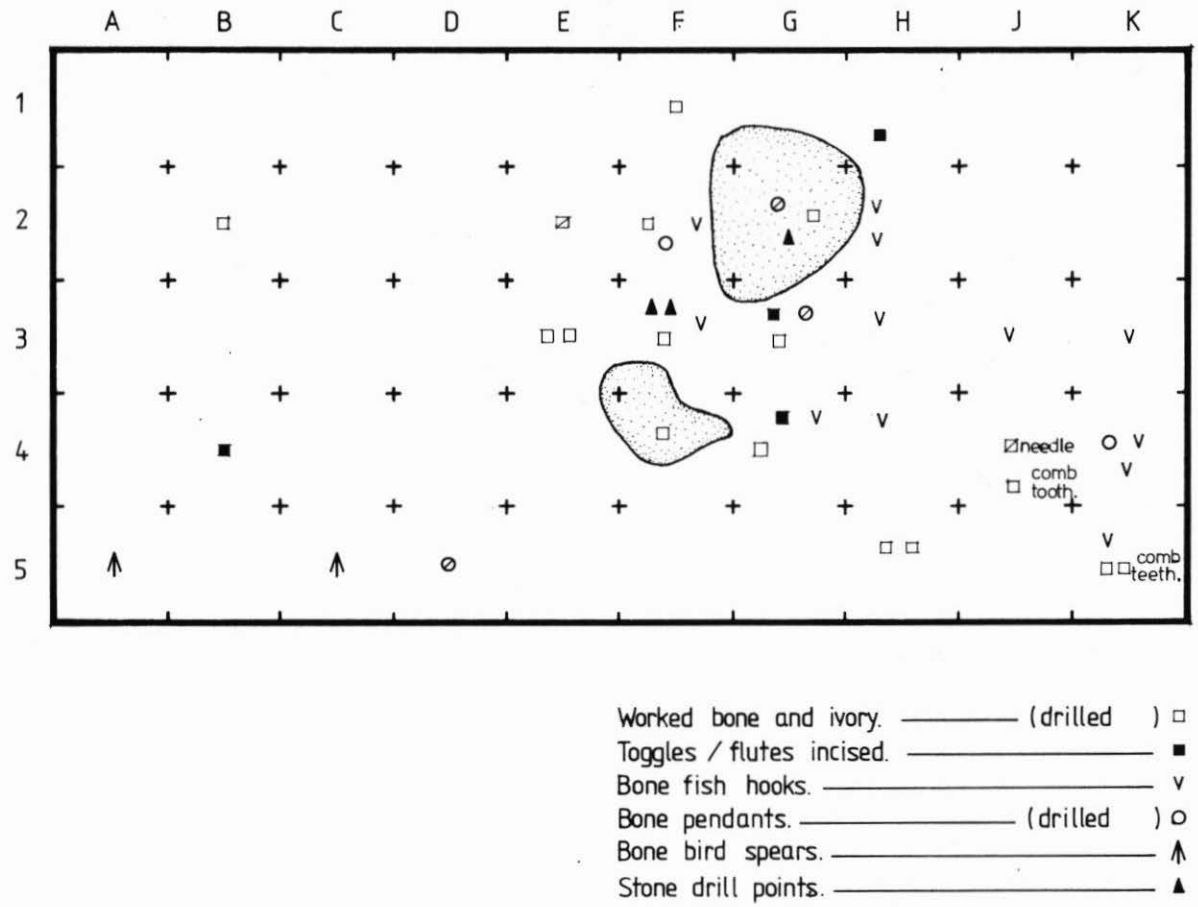

Figure 13: Distribution of bone artefacts and drills in Layer 2, S164/20.

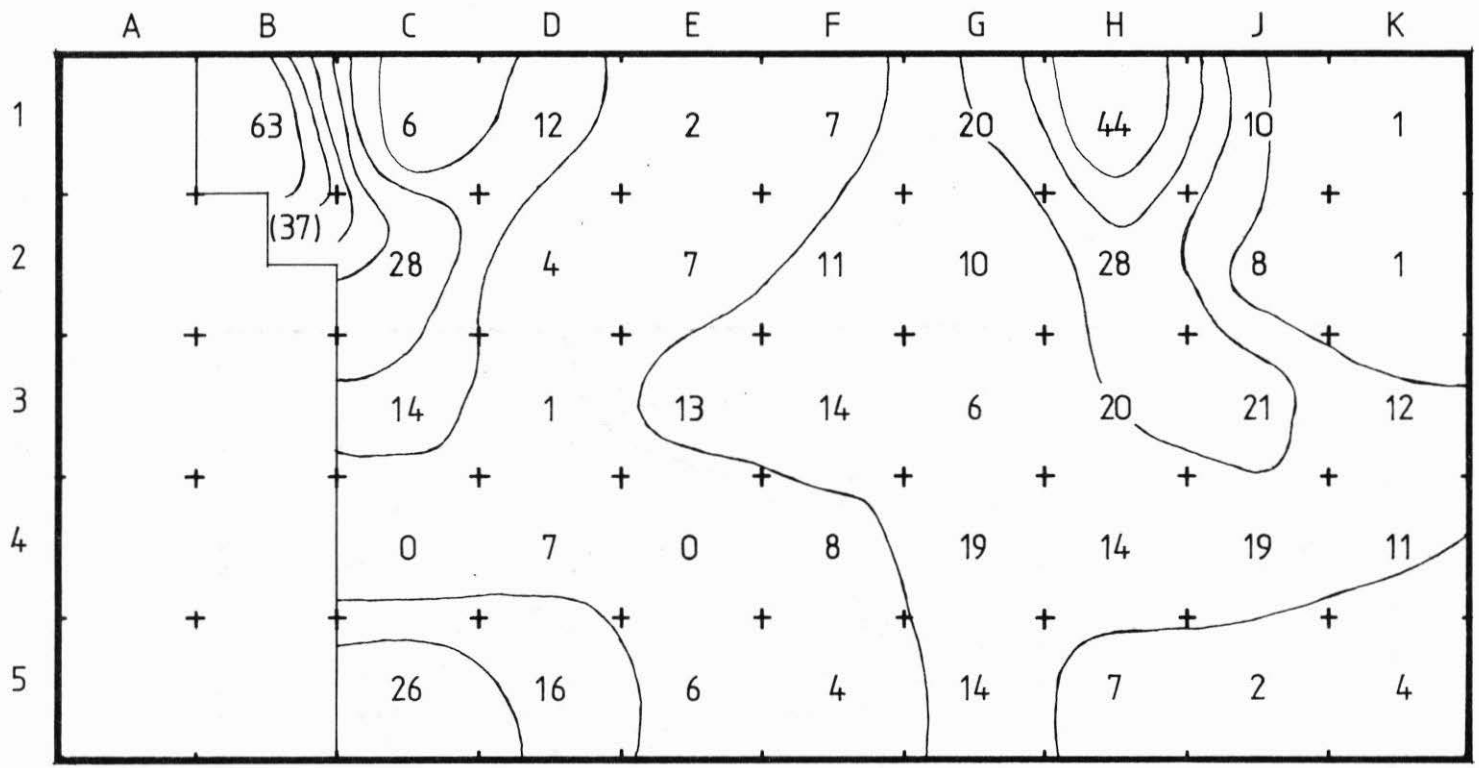

Figure 14: Distribution of flaked stone, other than nephrite objects and spall cutters, in Layer 2, S164/20.

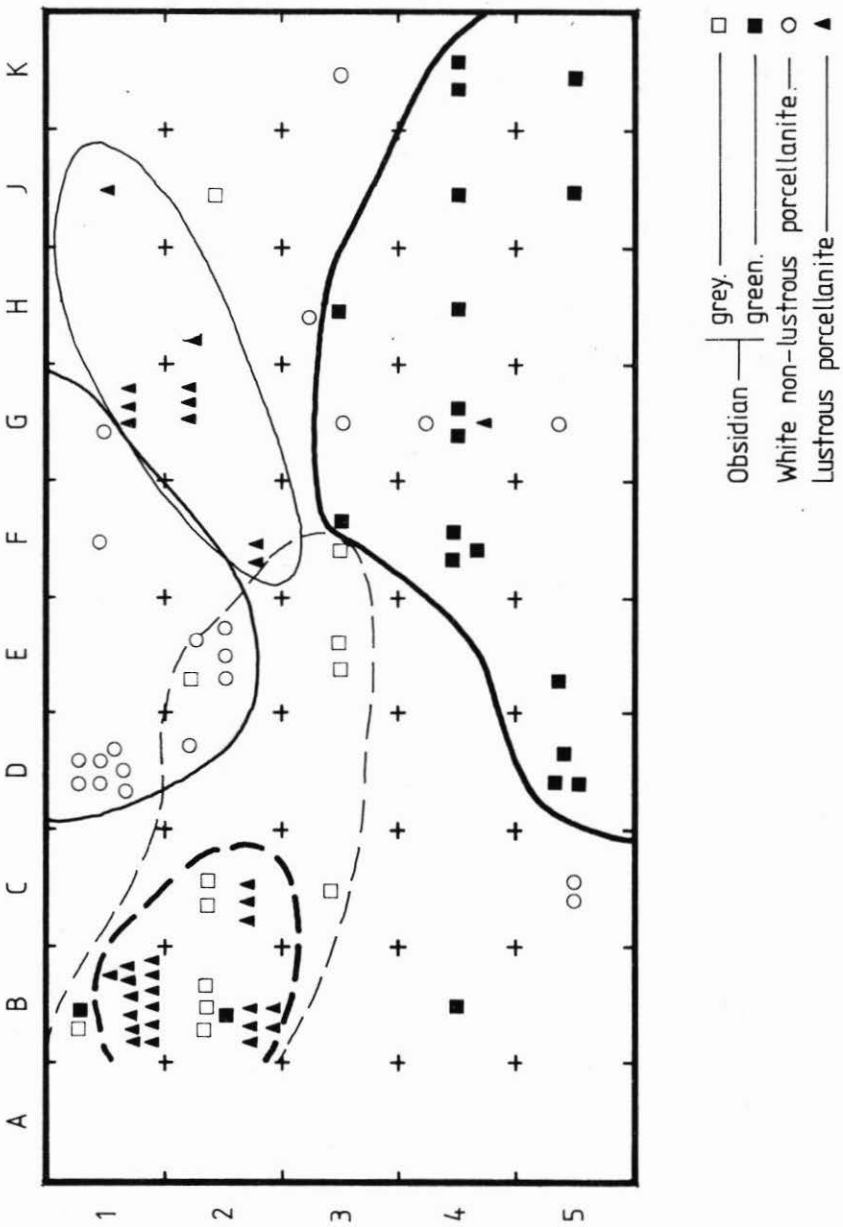

Figure 15: Distribution of less common stone types in Layer 2, S164/20.

CONCLUSIONS

It had been anticipated that little evidence would be salvaged from the Long Beach site, considering the history of disturbances. That substantial intact deposits were located, with midden, structures and artefacts in close association, should be a lesson to all archaeologists not to assume that a fossicked site is totally worthless. The value of the association demonstrated here between nephrite, sandstone grindstones, and spalls of volcanic rocks and greywacke reinforces the need to open contiguous squares in such sites and to remove baulks. It was also found to be much easier to evaluate the edges of disturbances when a wide area was exposed.

Once again the abundance of artefacts in Murihiku sites of all ages has been demonstrated. They offer great scope for comparative study of form, function, and process of manufacture and thereby the opportunity of linking sites and the layers within them. In the past we have been hampered by a floating chronology often assessed on the basis of the changing popularity of artefact styles, a situation with an inherent trap of circular argument which the archaeologist finds difficult to avoid. Long Beach can now be added to the securely dated Otago sites of Katiki Point and Taiaroa Head, and has the advantage of a much larger and more varied assemblage for comparison.

At Long Beach we are apparently dealing with a Late Archaic occupation which may have been established in an earlier phase, followed by an early form of Classic Maori occupation. In the Archaic layers there are characteristic silcrete blades, schist files, and the one-piece fish hook which later disappear, but there are also several composite fish hooks and good evidence that the barracouta point is being transformed already into the dominant Classic Maori dog-legged or lugged type. Within two or three centuries the assemblage displays some of the characteristic Classic Maori artefacts, such as the comb, cloak pin, kinked pendant and skewed amulet. The composite fish-hook points, while still made in the Late Archaic shapes, now show restrained but common use of serrations. In keeping with its date early in the Classic Maori period, the "baroque" style is not yet evident in the fishing gear.

As well as the obvious internal developments in fish hook designs, we can see continuity in the industrial use of whale bone and moa bone, and in the choice of stone materials. Chalcedonies of various types and silcrete dominate both Archaic and Classic assemblages. The only noticeable differences are the absence of nephrites and white porcellanites in the Archaic collection. Any meaningful study of the changing popularity of the different rock types must await definitive work on sources.

Analysis of the stone technology points to contact with blade makers in the Archaic period and to some local adze manufacture in volcanic rock types. The striking and use of small flakes continues into the Classic Maori level where the flaking technology is sometimes applied to nephrite. Adzes and chisels made from nephrite have been recovered from all Classic Maori sites and there is a tendency for flaking and hammer dressing to be abandoned in favour of sawing and snapping. That the Archaic techniques persist here beside the sawing method is a further indication that we are dealing with an Early Classic site.

There can be no doubt that some of the Classic Maori artefact styles are intrusive (e.g. the kinked pendant, the curved cloak pin, the desire to decorate with serrations), but we have also demonstrated that in those aspects of material culture that are closely geared to the successful exploitation of the environment, such as the design of fishing gear and stone tools, there is convincing evidence of continuity. If the Ngai Tahu influx involved mass migration it seems not to have resulted in total population replacement. Knowledge of the local environment did not have to be freshly acquired by the new arrivals, for it would appear that they merged with a substantial resident group with a long history of occupation.

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