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The Fishhook Assemblage from the Cross Creek Site (N40/260; T10/399), Sarah's Gully, Coromandel Peninsula, New Zealand

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ABSTRACT

Successive assemblages from the well stratified and dated Archaic site at Cross Creek, Sarah's Gully, are used to demonstrate changes in the fishhook component. These are related to similar changes in other Archaic assemblages which form part of a regional sequence for the Coromandel Peninsula. At the Cross Creek site, a loss of suitable moa bone for fishhook manufacture resulted in a change to *Cookia sulcata* shell as the raw material, and two-piece shell hooks replaced one-piece hooks of moa bone. This phenomenon is reflected in other sites in the region.
Keywords: SARAH'S GULLY, ARCHAIC, FISHHOOKS, MOA BONE, SHELL FISHHOOKS.

INTRODUCTION

New Zealand archaeologists have long used typological changes in stone adze heads to emphasise the closeness between early New Zealand and East Polynesian assemblages and to demonstrate general change within New Zealand itself (for example, Skinner 1938; Duff 1977). Similar claims have been made for a wide range of other items from fishhooks to ornaments. However, there is a need to demonstrate and date such changes in particular portable artefact categories on the basis of well stratified archaeological assemblages from individual regions, so that the timing of these changes may be individually assessed. The purpose of this paper is to illustrate a local change in fishhooks on the Coromandel Peninsula.

One-piece fishhooks in moa bone have been recovered from a considerable number of Archaic sites in the Coromandel region. In contrast, fishhooks of shell in both one and two pieces have been found in a few sites where moa bone hooks were not numerous. Although it was difficult to demonstrate that these latter sites were younger, it was often suggested that shell fishhooks appeared later than bone ones in the Coromandel sequence (Crosby 1966; Rowland 1975; Davidson 1979). Law's recent review (1984: 19), however, indicates that shell fishhooks were in use in New Zealand from fourteenth century Archaic contexts through to European contact. Thus, any change from bone to shell must be regional, and until now such a change has not been demonstrated in any one stratified archaeological site or among a set of sites in any particular region. The 1983 excavation at the Cross Creek site (Sewell 1984) at Sarah's Gully on the Kuaotunu Peninsula (Fig. 1) provides a sequence of manufacture of fishhooks in which one and two-piece shell hooks replaced one-piece hooks of moa bone. This change is explained as a regional response to a marked decrease in the supply of moa bone suitable for the manufacture of one-piece fishhooks.

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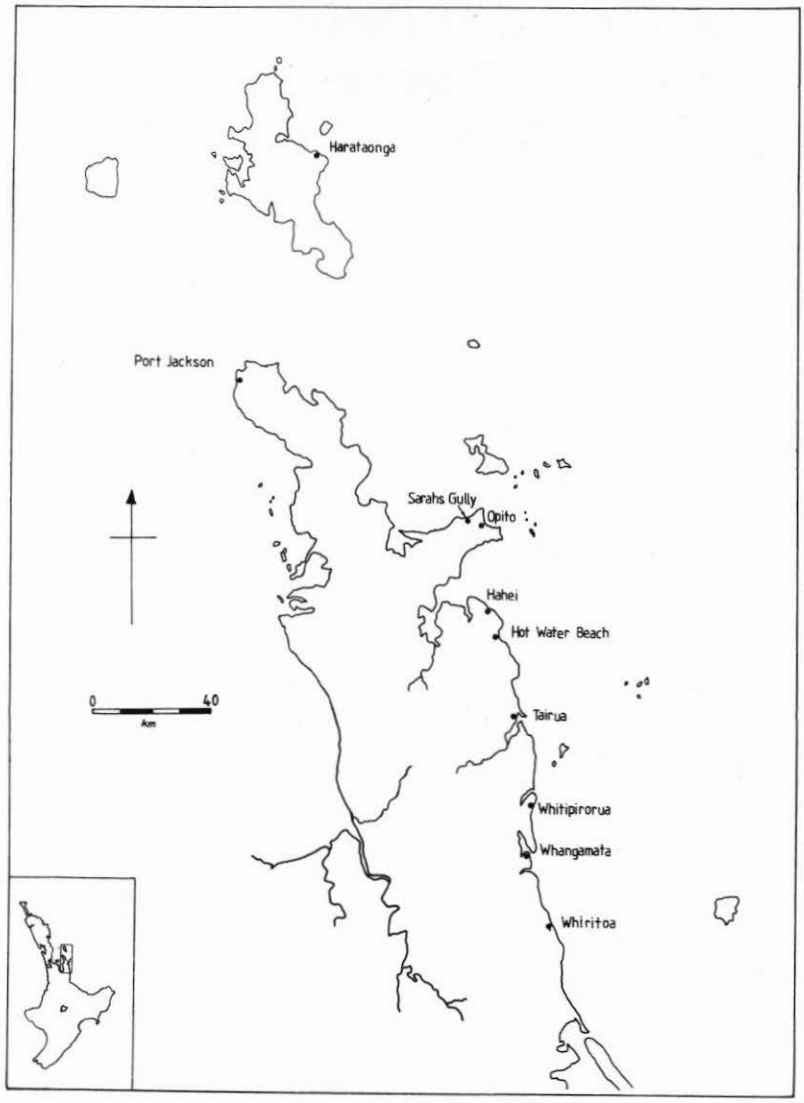

Figure 1: Coromandel Peninsula and location of sites mentioned in the text.

THE SITE

The Cross Creek site (Fig. 2) occupies a coastal dune at Sarah's Gully, Coromandel Peninsula. It is situated towards the northern end of the bay about 30 m to the south of a small creek. The site formerly extended to the banks of the creek, but much has been destroyed by erosion. A large open settlement (N40/9; T10/167) with rich middens was excavated by Golson (1959) on the opposite side of the creek. On the headland to the north, a small pa (N40/10; T10/168) was fully excavated (Birks 1960, Birks and Birks 1970, 1973). The Cross Creek site was excavated in 1983 (Sewell 1984) with major emphasis on exploration of the claim that discrete activity areas occurred in New Zealand Archaic sites. Following

an intensive mapping programme designed to identify activity areas in the uppermost exposed midden layer of the site, selected areas were stratigraphically excavated. These investigations indicated the presence of earlier levels of occupation. The deeply stratified deposits made it possible to compare patterns of deposition of faunal and artefactual remains in successive levels. This revealed that similar sections of the living area were used for particular activities throughout the occupation of the site.

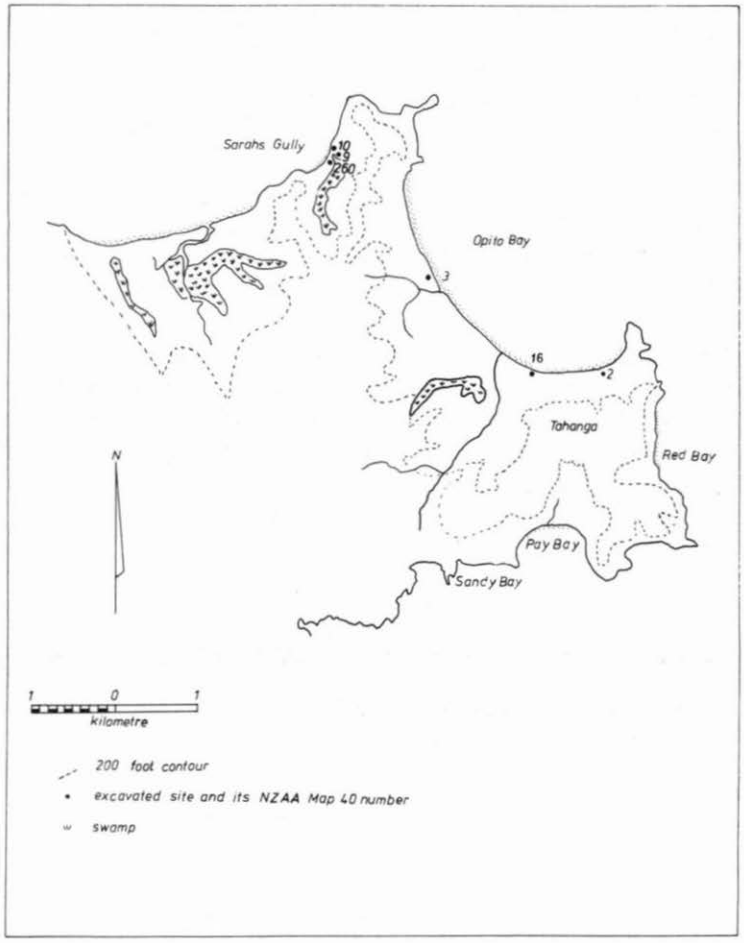

Figure 2: Sarah's Gully and Opito Bay with sites mentioned in the text.

A total of 170 square metres was excavated. Initially, all excavated material was sieved using a 4-mm-mesh screen. As time began to run out, a sampling strategy was adopted whereby one quadrant of each square metre excavated was sieved.

STRATIGRAPHY AND DATING

The stratigraphy of the site (Fig. 3) was as follows.

Layer 1. The exposed midden in a matrix of wind-blown sand. This deposit was intensively mapped before excavation.

Layer 2. Light brown silty sand, up to 800 mm in depth. There were some cultural items in this layer but as they were recovered from a disturbed area it is likely that they derived from Layer 3 beneath.

Layer 3A and 3B. These comprise one cultural layer. Layer 3A was a layer of dense concentrated midden. Layer 3B consisted of grey/greasy black sand, 100–400 mm in depth, containing cultural material. Fifty-four associated features were identified.

Layer 4. White/cream culturally sterile sand, 0–400 mm in depth.

Layer 5. Grey/black stained sand, 100–400 mm in depth, containing cultural material. Thirty-three features were identified.

Layer 6. White sterile sand, 200–600 mm in depth.

Layer 7. Black/brown sand, 100–200 mm deep, with cultural material. Thirteen features were identified.

Layer 8. Yellow, culturally sterile sand, 40–100 mm in depth.

Layer 9. Grey sand, 50–150 mm in depth, containing cultural material and one firescoop.

Layer 10. Natural; orange clay-like material or white culturally sterile beach sand.

The transition between layers was marked in most of the areas excavated, although Layer 4 was absent in Area G.

Radiocarbon dates were obtained from tuatua shells (*Paphies subtriangulata subtriangulata*) from Layers 3, 5 and 7. A sample from the exposed surface midden was not submitted because of possible contamination from modern shells. No tuatua shells were found in Layer 9. As it is probable that Layers 7 and 9 were very close in time, no other sample from Layer 9 was submitted for dating.

The relationship between stratigraphic layers, occupation horizons or living floors, and radiocarbon dates is summarised in Table 1.

TABLE 1
RELATIONSHIP BETWEEN LAYERS, OCCUPATIONS, AND RADIOCARBON DATES

Stratigraphic Layer	Occupation	Age B. P. Old $T\frac{1}{2}$	Age Range A. D.*	N.Z. Number
1	V	–	–	–
2				
3	IV	504 ± 36	1350–1430	6798
4				
5	III	544 ± 54	1325–1425	6825
6				
7	II	693 ± 30	1250–1340	6800
8				
9	I	–	–	–

* After Klein *et al.* 1982 at 2 standard deviations

FISHING AND FISHING GEAR (Figure 4)

A study of the fishhooks and raw materials recovered from the Cross Creek Site indicates a change through time in both form and material. Evidence of fishing in the form of fishbone and fishing gear was present in all cultural layers of the site. The fishing gear from Layers 3, 5 and 7 includes fishhooks, finished and unfinished, and the residue of manufacture. The

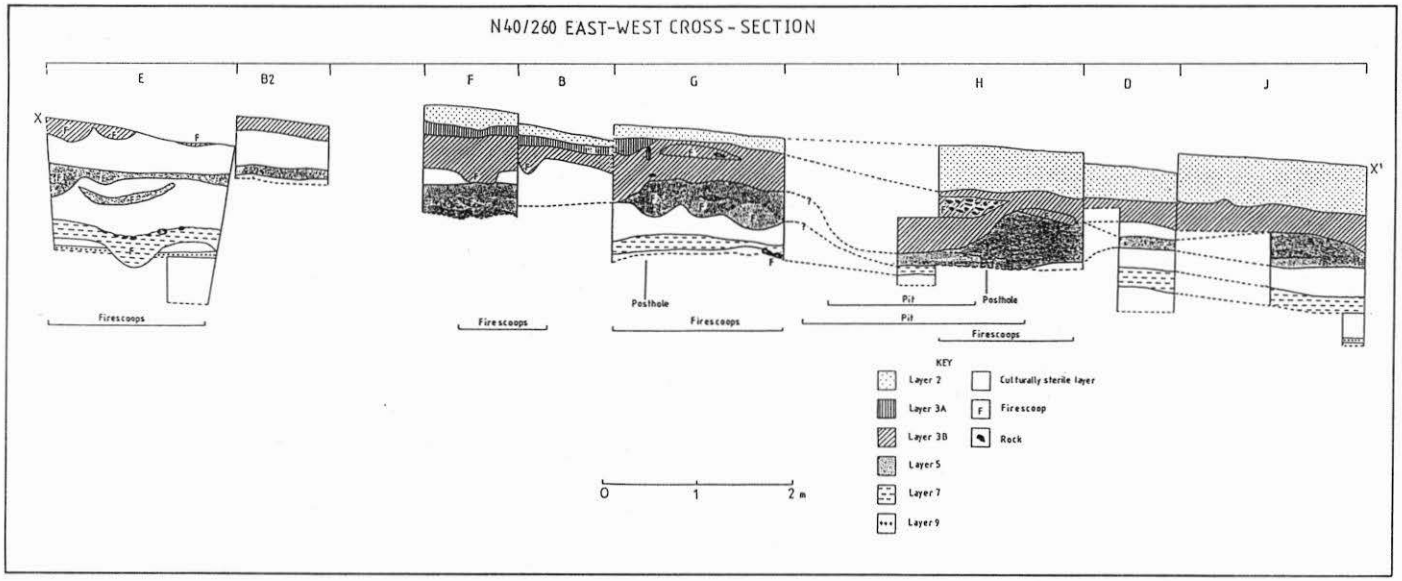

Figure 3: East-west cross-section of the Cross Creek Site.

species of fish identified in each layer are shown in Table 2. There is no significant variation in the species taken, or their proportions, throughout all the periods of occupation.

TABLE 2
NUMBER OF FISH BY LAYER

	Layer 1	Layer 2	Layer 3A	Layer 3	Layer 5	Layer 7	Layer 9
Snapper (*Chrysophrys auratus*)	31	30	58	44	41	42	2
Leatherjacket (*Parika scaber*)	32	16	58	24	16	20	1
Wrasses (*Pseudolabrus* spp.)	5	9	5	12	4	10	1
Kahawai (*Arripis trutta*)	1	1	2	2	1	1	1
Barracouta (*Thyrsites atun*)	1		1				
Trevally (*Caranx lutescens*)	1		2	1			
Gurnard (*Chelidonichthys kumu*)		p					
Blue cod (*Parapercis colias*)			p				
Sea perch (*Helicolenus papillosus*)			p				
Porcupine fish (*Allomycterus jaculiferus*)						p	
Terakihi (*Nema macropterus*)						p	

Table 3 illustrates the number of hooks, cores, tabs and worked shell recovered from each layer. The two sea mammal bone hooks are whale (M. Taylor, pers. comm.). The ivory hooks were identified as elephant seal tooth (I. Smith, pers. comm.). As indicated in Table 3, the majority of fishing gear made of shell came from Layer 3, whereas moa bone hooks predominated in Layer 7.

TABLE 3
FISHHOOKS, CORES, TABS AND PIECES OF WORKED SHELL BY LAYER

Occupation	Layer	Shell		Sea Mammal			Moa bone		Ivory
		Hook	Worked	Hook	Core	Tab	Hook	Core	Hook
V	1		2						
	2	3	1						
IV	3	18	26	1			2		
III	5	6	4	1		1			2
II	7		1		1		5	9	1
TOTAL		27	34	2	1	1	7	9	3

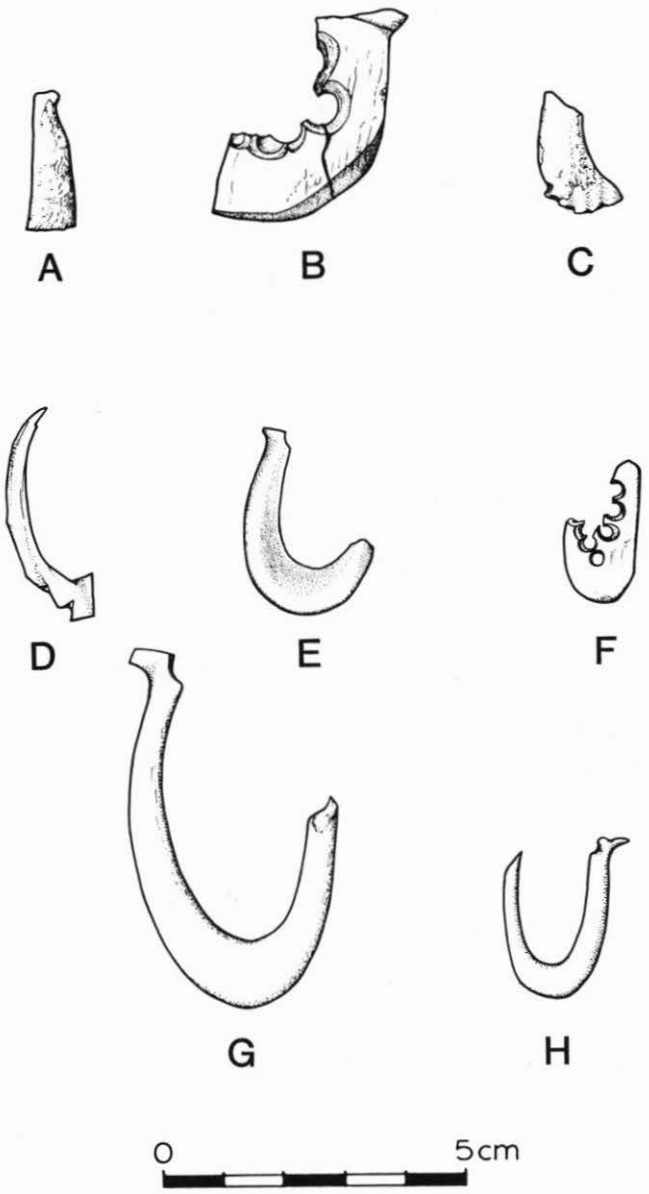

Figure 4: Sample of fishhooks from Layers 3, 5 and 7. a. Shell two-piece shank, layer 3. b. Partly made moa bone hook, in two pieces, layer 3. c. Shell two-piece point with overlapped base joint, layer 3. d. Shell two-piece point with abutted base joint, layer 5. e. One-piece shell hook, layer 5. f. Ivory hook, layer 5. g. Moa bone hook, layer 7. h. Ivory hook, layer 7.

MOA BONE FISHHOOKS

Table 3 amply illustrates the reliance on moa bone for the manufacture of fishing gear during Occupation II. It is possible that bone from a single bird, pieces of which were recovered from Layers 7 and 9, was utilised. The limited number of moa bones recovered

were examined by B. Kooyman (pers. comm.), who suggests they represent one of the larger, medium-sized moas, in all probability *Dinornis struthoides*. The presence of nine moa bone fishhook cores in association with five partly made and broken one-piece moa bone hooks indicates that such hooks were made on the site, although the industry was not as intensive as at Opito (N40/3; T10/161) where 230 one-piece hooks and fragments and 83 cores were recovered. Moa bone hooks were also excavated at the adjacent Sarah's Gully Settlement, where most were one-piece hooks, usually with incurved points (Golson 1959: 45; Green 1963: 66). Dates for this site place it firmly in the fourteenth century A.D. In comparison to the cores retrieved from Hot Water Beach (N44/69; T11/115) and N40/3 at Opito, the cores from the Cross Creek site are fairly small, ranging from 10.1 mm to 28.8 mm with a mean of 19.01 mm.

The small amount of fishing gear recovered from Layer 5 contains little evidence for the manufacture of hooks on the site during Occupation III. A range of materials was used for fishhooks—ivory, whale bone and shell, but there was no evidence for working of moa bones. The presence of fishhooks of elephant seal tooth and whale bone is probably indicative of opportunist tactics. A stranded whale or elephant seal would represent not only plentiful meat, but also bone and ivory of sufficient size to be used for industrial purposes.

The evidence from Layer 3 is in complete contrast to the evidence from Layer 7. During Occupation IV, the manufacture of shell fishhooks was of prime importance. However, a small fragment of shank and a broken, partly made, one-piece hook in moa bone suggest the use of this material had not yet completely died out. In addition, there was one fishhook of whalebone which was broken at the base of the shank.

SHELL FISHHOOKS

Twenty-seven fishhooks made from Cook's turban shell (*Cookia sulcata*) were recovered from Layers 2, 3 and 5 (Table 3). The location of the hooks from Layer 2 and the trampled edge of the midden at that point suggest that these three hooks derived from Layer 3. All the hooks were unbarbed. The single one-piece shell hook came from Layer 5; it was unbarbed and of similar shape to the one-piece shell hooks retrieved from N40/2 (T10/160) at Opito. The remaining shell hooks are points or shanks of two-piece hooks, some with lapped and others with abutted joints at the base (Table 4).

TABLE 4
NUMBER OF PARTS OF SHELL FISHHOOKS BY LAYER

Occupation	Layer	Two-piece Shank		Two-piece point		One-piece Hook	
		Base	Head	Base Joint Abutted	Base Joint Lapped	Tip	
IV	2, 3	1	3	4	7	6	1
III	5		1	4			

There is some indication of a change in the preferred form of point in Occupation IV. The four two-piece points from Layer 5 all have an abutted base joint, whereas the majority of base joints from Layer 3 overlapped with the base of the shank. However, the sample is too small to be certain on this point. One piece of worked shell, possibly but not necessarily from a fishhook, was recovered from Layer 7.

EVIDENCE OF MANUFACTURE OF FISHHOOKS

Table 3 indicates that the most common remains of bone fishhook manufacture were cores—the discarded pieces of bone drilled from the centre of the tab. Nine cores of moa bone and one of whale bone were recovered—all from Layer 7. The presence of the moa bone cores supports the contention that hooks of this material were manufactured at the site during Occupation II.

The remains of broken *Cookia sulcata* shells from Layer 3A and the quantity of shells with clearly visible cutting or grinding marks leaves no doubt that two-piece shell hooks were manufactured at the site during Occupation IV.

Several possible explanations can be suggested for the lack of shell hooks in Layer 7. No shell hooks and only one piece of worked shell were recovered from this layer, but only a small area was opened up—about half the area excavated in Layer 3. Thus the lack of shell hooks in Layer 7 could be attributed to sampling error and the claim made that if more of this layer had been opened up more shell hooks would have been found. The other possibilities are disintegration of shell material in the earlier layer, or a real absence of shell hooks during Occupation II. The final explanation is preferred. Although the area sampled was small, the shell remains were not dense and it seemed clear that there was no concentrated shell midden as in Layer 3A. Thus shell survived in Layer 7, but not in quantity. Therefore, the largest single pointer to the manufacture of shell hooks on the site, the presence of large quantities of *Cookia sulcata* shells, is not present in Layer 7. Layer 3A contained an average of 16.6 *Cookia sulcata* shells per square metre, whereas Layer 7 yielded only 0.6 per square metre. The possibility of disintegration of shell hooks can also be discounted for the same reasons. Even if the hooks themselves had disintegrated, the evidence of manufacture in the form of broken shells should still be present. It can be argued, therefore, that shell fishhooks were absent in Layer 7 because they were not made in any quantity during Occupation II.

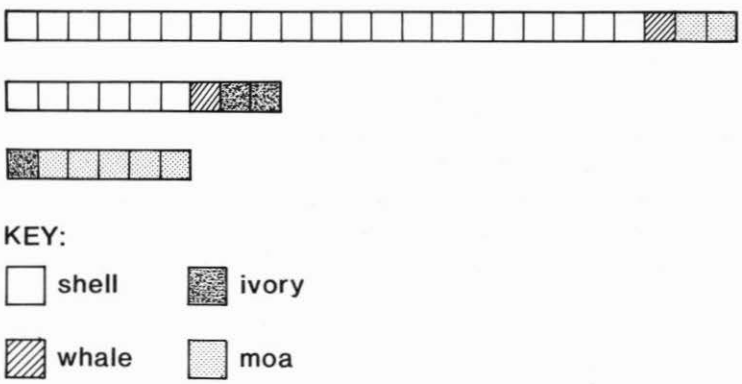

Figure 5: Change in material used in the manufacture of fishhooks. Each square represents one fishhook. Upper, Occupation IV. Middle, Occupation III. Lower, Occupation II.

The marked change in the material used for fishhook manufacture is illustrated in Figure 5. The decrease in fishhooks made from moa bone may be correlated with a decline in the availability of moa bone as raw material in Occupations III and IV. This would be consistent with the extinction of the moa by man either directly or through his activities in

reducing their habitat (Davidson 1979). Such a pattern is well attested in the Coromandel region's Archaic sites of the fifteenth century A.D. (Davidson 1979). The local decline and eventual extinction of moa would mean that fresh bone became increasingly difficult for the growing population to obtain. One solution was a change to shell as the material used to make fishhooks. Other possibilities were the two-piece fishhook with wooden shank and point of bone other than moa, or a one-piece hook in human bone. The increased use of shell may be only a local response, because it seems that other options were taken up in other parts of New Zealand. In the Coromandel region, the decision to manufacture hooks predominantly in shell may have been influenced by the local abundance of suitable raw material. Live specimens of *Cookia sulcata* can still be picked off the rocks at a depth of 2 m from the surface and it is unlikely that prehistoric populations would be greatly different from those of to-day.

DISCUSSION

The lack of readily available moa bone is advanced as a reason for the change to shell fishhooks at the Cross Creek site. The argument is not that shell fishhooks do not date from the beginning of the sequence in parts of New Zealand. Rather, it is that in this area where moa hunting was initially an important strategy (Davidson 1984), there was a change in dominance from fishhooks in moa bone to those in shell. In Palliser Bay, on the other hand, one-piece shell fishhooks appeared in the Washpool midden site at the beginning of the sequence (Leach 1979: 109). However, Leach has suggested (1979: 131) that moa hunting was not an important early economic strategy in this region. As a result, moa bone for industrial purposes was not plentiful in Palliser Bay, and the few pieces that in fact occur were brought there from outside the region.

The presence of shell fishhooks in some early New Zealand sites (e.g., Washpool) is not unexpected given the widespread use of pearl shell fishing gear in East Polynesia. However, pearl shell does not occur in New Zealand, so experimentation with other materials was required. The probable outcome was that early in the New Zealand sequence, if there were a choice of raw materials for manufacture of fishhooks, moa bone became the preferred material. A lack of industrial moa bone would result in alternatives being sought, one of which was shell. As Law (1984: 6) stated, "a deterministic model ... is that they [shell fishhooks] were used where shell was available when suitable bone was rare ...."

The lack of moa bone for fishhook manufacture did not necessarily result in a change to shell alone. Other materials were available and were used. For example, ivory, as at Hot Water Beach (Leahy 1974) and Wairau Bar (Duff 1977: 216), or human bone, as at Kauri Point (Green 1978), were sometimes used, as was sea mammal bone. Examination of some of the bone fishhooks in the Auckland Museum has revealed that a considerable number of hooks thought previously to be of moa bone were in fact made of whale bone (M. Taylor, pers. comm.).

Shell fishhooks are not common and are known from only a few excavated sites in New Zealand. They have been reported from a few widely scattered sites in the South Island—Tahunanui in Nelson, Rakautara Cave near Kaikoura, and in Fiordland (Leach 1979: 110; Davidson 1984: 68). Sites in the North Island with shell hooks appear to be more numerous but are quite localised. In particular, there are concentrations of sites containing such hooks in the Far North and in the Coromandel region, although the actual number of shell hooks from each excavated site is small. As indicated by Law (1984: 5), shell points

were commonly made from *Cookia sulcata*. Examples recovered from excavations on the Coromandel Peninsula which support this claim are listed in Table 5.

TABLE 5
***COOKIA SULCATA* SHELL HOOKS FROM COROMANDEL EXCAVATIONS**

Site	Number of Pieces	Type
Opito (N40/2; T10/160)	9	6 points 3 one-piece
Whiritoa (N53/4; T12/500)		One piece
Whitipirorua (N49/16; T12/16)	6	5 points 1 shank
Opito (N40/16; T10/174)	3	Points
Kauri Point Pa (N53-54/5; T12/501)	4	One-piece
Cross Creek	27	1 one-piece 5 two-piece shanks 21 two-piece points

In some early Archaic sites in the Coromandel region (such as Tairua, Hahei and Hot Water Beach), *Cookia sulcata* shells were recovered during excavation but there was no evidence of manufacture or use of shell fishhooks of this material. At these sites, both moa bone and fishhooks in moa bone were found and it appears that when there was no shortage of moa bone, no other material was used.

Of the Coromandel sites with *Cookia sulcata* shell fishhooks, three are located within a 4 km radius on the Kuaotunu Peninsula. It could be argued that a very localised switch to the use of shell fishhooks occurred on this peninsula. On the other hand, this particular locality has received far more intensive archaeological attention than most parts of the North Island. Therefore, what might appear to be a restricted local tradition may in part be an artefact of archaeological sampling. Surface collections suggest this.

Davidson (1979: 198) states that the position of shell fishhooks in the Coromandel region has been somewhat obscure. She speculates that shell hooks may have been present in a wider range of sites but either not reported or not recognised. It seems unlikely that shell hooks could be completely overlooked. It is more likely that the actual number recovered would be less than the total population. Pieces of shell fishhook are very small and some are easily missed during excavation. This was demonstrated at the Cross Creek site. Because of their small size and their association with more than 1,000 broken *Cookia sulcata* shells in an area of concentrated midden, less than half of the shell hooks recovered were recognised during excavation. The rest were retrieved on analysis of the midden material in the laboratory. Nonetheless, approximately ten hooks were recovered during excavation. If such fishhooks were present at any other site in the east coast Coromandel region, at least some of them should have been recognised during excavation, as indeed they were at Opito (N40/2 and N40/16), Whiritoa (N53/4) and Whitipirorua (N49/16). This argument would seem to hold for the material excavated at the Sarah's Gully Settlement (N40/9). Although a detailed analysis of the contents of the midden is not available, it is contended that had fishhooks of shell been made on this site, a few pieces would have been recognised during

excavation. If this argument is accepted, it would be further evidence that the change from moa bone to shell for hook manufacture took place after the fourteenth century A.D.

CONCLUSION

The fishing gear from the stratified and dated Cross Creek site demonstrates a local change from moa bone to shell for fishhook manufacture. There was no corresponding change in the fish caught, indicating that a change in fishing strategy or target species was not a factor in this change. The earliest occupation levels indicate manufacture on the site of fishhooks of moa bone in the thirteenth century A.D., whereas hooks of shell were made during a more recent occupation from the late fourteenth to the fifteenth century A.D. In addition, stylistic change took place—not only from one-piece to two-piece hooks but also in the shape of the shell two-piece hooks themselves. There was a change in preference from abutted base joints during Occupation III to overlapped base joints in Occupation IV.

Boileau (1980: 92) posits a homogeneous and well-established cultural tradition in the Coromandel area by the fourteenth century A.D. She points to the similarity between the material from Hot Water Beach and Opito (N40/3), with extensive use of moa bone as raw material for fishhooks and evidence for decreasing supplies of moa bone in later levels. There is a fourteenth century A.D. basal date from N40/3 (Green 1963: 60). Moa bone one-piece fishhooks in the nearby Sarah's Gully settlement (N40/9) are also dated to the fourteenth century. These assemblages are probably somewhat earlier than the late fourteenth to fifteenth century Occupation IV at the Cross Creek site, when the manufacture of fishhooks from *Cookia sulcata* shell was well established. Thus, the evidence from the Cross Creek site suggests that in this particular region, the response to the decreasing availability of moa bone was a change to shell as the raw material for fishhooks.

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REFERENCES

Birks, L. 1960. Pa at Sarah's Gully, Coromandel Peninsula. *New Zealand Archaeological Association Newsletter* 3(2): 16–20.

Birks, L., and Birks, H. 1970. Radiocarbon dates for a pa site at Sarah's Gully, Coromandel Peninsula. *New Zealand Archaeological Association Newsletter* 13(2): 63.

Birks, L., and Birks, H. 1973. Additional Dates for Sarah's Gully Pa Site. *New Zealand Archaeological Association Newsletter* 16(2): 73.

Boileau, J. 1980. The Artefact Assemblage from the Opito Beach Midden, N40/3, Coromandel Peninsula. *Records of the Auckland Institute and Museum* 17: 65–95.

Crosby, E. 1966. Maori Fishing Gear. A Study of Development of Maori Fishing Gear, Particularly in the North Island. Unpublished M.A. Thesis, Anthropology, University of Auckland.

Davidson, J. M. 1979. Archaic Middens of the Coromandel Region: A Review. *In* Anderson, A. (Ed.), Birds of a Feather, pp. 183–202. *New Zealand Archaeological Association Monograph* 12.

Davidson, J. M. 1984. *The Prehistory of New Zealand.* Longman Paul, Auckland. 270p.

Duff, R. 1977. *The Moa-hunter Period of Maori Culture.* Government Printer, Wellington. 433p.

Golson, J. 1959. Culture Change in prehistoric New Zealand. *In* Freeman, J. D. and Geddes, W. R. (Eds), *Anthropology in the South Seas*, pp. 29–74. Thomas Avery, New Plymouth.

Green, R. C. 1963. Summaries of Sites at Opito, Sarah's Gully and Great Mercury Island. *New Zealand Archaeological Association Newsletter* 6(1): 57–69.

Green, R. C. 1978. Dating the Kauri Point Sequence. *Historical Review* 26: 32–44.

Klein, J., Lerman, J. C., Damon, P. E. and Ralph, E. K. 1982. Calibration of Radiocarbon Dates. *Radiocarbon* 24 (2): 103–150.

Law, G. 1984. Shell Points of Maori Two-Piece Fishhooks from Northern New Zealand. *New Zealand Journal of Archaeology* 6: 5–21.

Leach, B. F. 1979. Excavations in the Washpool Valley, Palliser Bay. *In* Leach, B. F. and Leach. H. M. (Eds), Prehistoric Man in Palliser Bay, pp. 67–136. *National Museum of New Zealand Bulletin* 21.

Leahy, A. 1974. Excavations at Hot Water Beach (N44/69), Coromandel Peninsula. *Records of the Auckland Institute and Museum* 11: 23–76.

Rowland, M. J. 1975. Tairua and Offshore Islands in Early New Zealand Prehistory. Unpublished M.A. Thesis, Anthropology, University of Auckland.

Sewell, B. 1984. The Cross Creek Site (N40/260) Coromandel Peninsula. Unpublished M.A. Thesis, Anthropology, University of Auckland.

Skinner, H. D. 1938. Maori adzes, axes, chisels and gouges from the Murihiku Region, New Zealand. *Proceedings of the Third Congress of Prehistorians of the Far East (Singapore, 1938)*, pp. 142–72.

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