HOPE ISLAND: SALVAGE EXCAVATION OF A KOMBUMERRI SITE

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INTRODUCTION

This paper reports the salvage excavation of a shell midden at Hope Island, Gold Coast City, southeast Queensland. Archaeological investigations were carried out in the Gold Coast region during the late 1960s and early 1970s (e.g. Haglund-Calley and Quinnell 1973; Haglund 1975, 1976), but as academic input into the area waned it became something of a folk theory in the mainstream Anglo-Saxon community that nothing worthwhile in the way of archaeological evidence remained in the area. The Kombumerri people, traditional owners who have never ceded title to their land, knew differently. This paper follows an extensive site recording program undertaken by the Kombumerri Cultural Centre and the Anthropology Museum, University of Queensland, which has clearly demonstrated the correctness of their view: material evidence of significance to the local Aboriginal community abounds within the Gold Coast City limits and its environs.

HOPE ISLAND: THE ULTIMATE SITE

Hope Island (Figure 1) was to become the massive Sanctuary Cove development complex. Kombumerri site recorder, Michael Aird, surveyed the island and found stone artefact scatters and an extensive shell midden on the bank of the Coomera River. Samples of the stone artefacts were collected, but the midden was marked for destruction by the development. As an important marker of their heritage, the site assumed great significance for the local Aboriginal community. Kombumerri people undertook discussions with the developer and it was agreed that there was scope for salvage. This led to the involvement of a team of archaeologists who were given the brief to excavate a small portion of the midden. It was hoped at the time that the remainder of the site would then be preserved despite the imminent road building activities which were threatening its existence. While the Kombumerri people wanted the place unscathed, they reasoned that an archaeological analysis and interpretation would add a useful dimension to the argument for protection of what was clearly going to be the only Hope Island midden to have any chance of surviving the forthcoming devastation.

Designated the Hope Island Site, the midden lay on the southern bank of the Coomera River (Grid Reference: NQ 366187, Southport Sheet No.9542 - II, Edition 1, 1:50,000 series). Initial examination of the deposit showed a thick bed of shell exposed directly at the waterline. Midden material was scattered over the surface in varying concentrations for some 45m away from the river (Figure 2). The surface was also littered with debris from European campers and fishing people. Squatter-type camps and huts had apparently been here for many years as Hope Island had been a popular fishing place. We wondered about the antiquity of its popularity: how long had Kombumerri owners enjoyed this place ? And was it a good fishing spot through its history ?

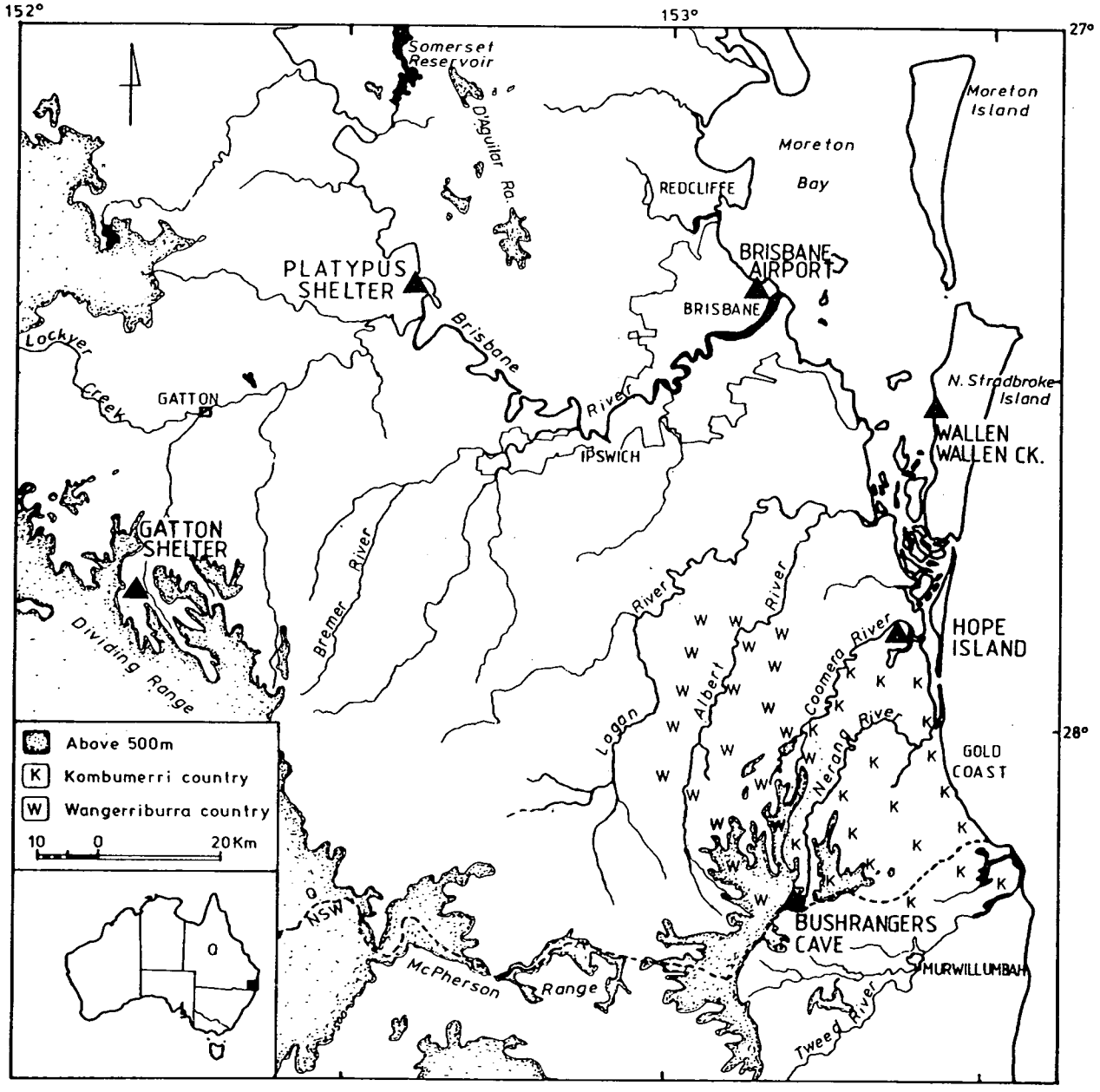

Figure 1. Southeast Queensland showing the study area and other major archaeological sites (after Hall 1986:89).

THE EXCAVATION

The excavation team intended to minimize damage to the site. In addition, the questions being asked were of the most basic kind: How old is the midden ? What kinds of activities were pursued there ? What foods were eaten ? Given these criteria, and following the rationale of Jones (1980) and Bowdler (1983) concerning the appropriate form of sampling, it was decided to excavate a very small portion of the midden.

The site was excavated over five days from February 14-18, 1986. A trench (1.5m x 0.5m) was marked out over the area of greatest surface density of shell, and this was excavated as three discrete 50cm x 50cm squares, designated A, B, C. A second trench (1m x 0.5m) was located at the water's edge where the exposure of shell had been observed. This was excavated as two discrete 50cm x 50cm squares labelled E and F (Figure 2).

Field procedure essentially followed guidelines suggested by Johnson (1980). Excavation squares were gridded out with string lines and levels below a datum point were recorded for their surfaces. Deposit was then removed in "bucket spits" following natural strata where possible, but generally limiting the depth of each excavation unit, or spit, by the volume of deposit needed to fill a 10-litre bucket. Floor levels were recorded at the completion of each excavation unit. The pH of the matrix was recorded, generally for every second spit, and changes in matrix colour were monitored using a Munsell soil colour chart (see Table 1 and Figures 3 and 4). An Individualized Finds system (Johnson 1980:97) was also used, which was intended to record the 3-dimensional coordinates of significant finds such as artefacts and large pieces of bone. These were bagged and labelled separately.

Full buckets from each square were weighed on a tared spring balance and wet-sieved in the river through 3mm mesh screens. This mesh size was chosen for its efficiency (Johnson 1980; Hermes 1984:37) and to allow for comparability of data with other samples obtained in coastal southeast Queensland. All material retained by the sieve for each spit was then bagged in labelled plastic bags ready for re-sieving in fresh water in the laboratory. All data were recorded on excavation forms, one for each spit. Photographs were continually taken as the excavation proceeded, and section drawings were made at the completion of digging (Figures 3 and 4).

Table 1. Matrix pH Values.

X.U.	SQUARE A	SQUARE E
Surface	8.0	
1	8.0	8.0
3	8.0	8.0
7	8.0	
8		8.0
9	8.0	
11	8.0	7.5
13		7.5
14	8.0	
15		7.5
17		8.0
18	8.0	
22	8.0	

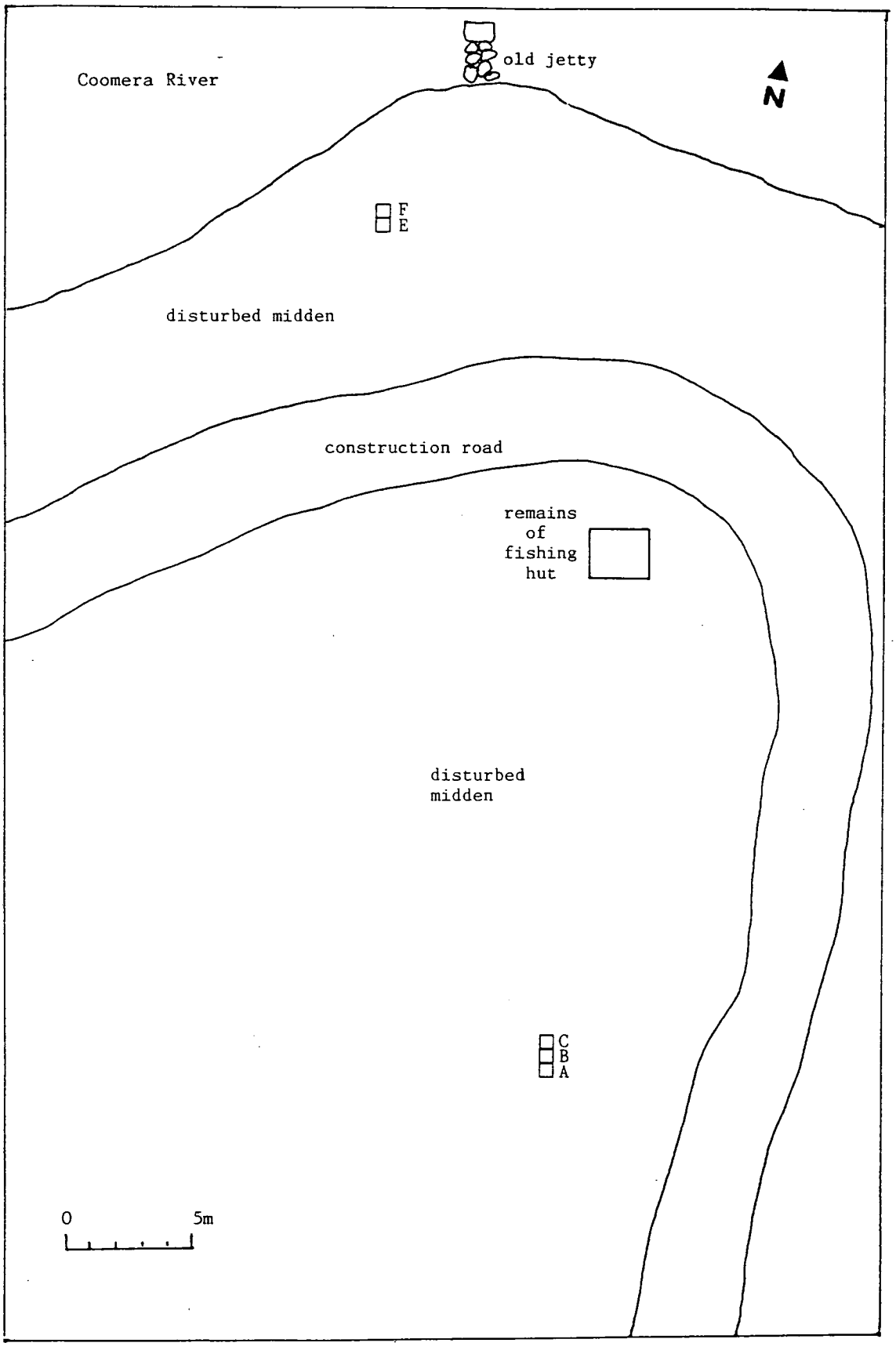

Figure 2. Plan of the Hope Island Site.

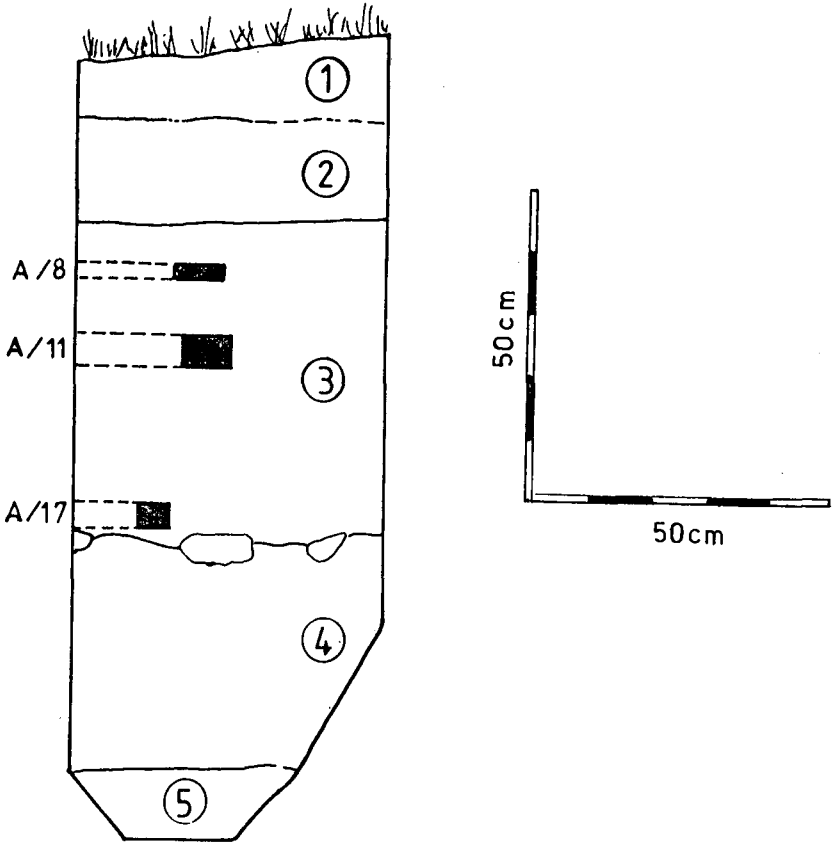

Figure 3. Hope Island Square A excavation profile. Layer 1 is shell in dark grey sand; Layer 2 is shell in pale grey sand; Layer 3 is dense shell in grey ashy sediment; Layer 4 is sparse shell in dark brown sediment with many rocks; Layer 5 is pale yellow sterile sand. Provenances of dated charcoal samples are shown.

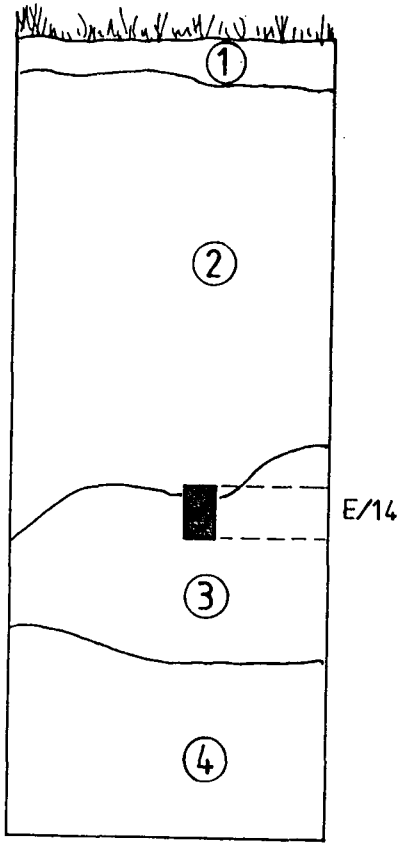

Figure 4. Hope Island Square E excavation profile. Layer 1 is sparse fragmented shell in dark grey sand; Layer 2 is dense shell in grey sand; Layer 3 is sparse shell in brown gravelly sediment; Layer 4 is bedrock. Provenance of dated charcoal sample is shown.

Squares A and E were chosen for initial analysis, with the remainder of the excavated material being held over for further questions which may arise out of either this analysis or future Kombumerri considerations. Material was re-sieved in clean water, once again using a 3mm mesh screen, and then air-dried on laboratory benches. A team of sorters set out to separate material into various shell categories, bone, charcoal, stone artefacts, other stone, crustacea, and plant.

Shellfish remains from each spit were sorted into taxa by separating common diagnostic elements of individual shells and calculating minimum numbers of individuals (MNI). For several reasons this method was chosen in preference to sorting all shellfish for proportional comparison by weight. Experiments conducted by Nichol and Williams (1981) demonstrated that sorting and counting only those shells and shell fragments which are diagnostic of individuals is less time-consuming and more accurate than quantifying shell species by weights (see also Bowdler 1983;140). Rowland (1982) has argued that the use of MNI calculations for shell is inconsistent with quantitative analysis of other midden components such as charcoal, stone, pumice, etc., which must be weighed, and that the use of weights for all components is an important technique which can describe the general morphology of sites. However, given the greater time and labour requirements, the exclusive value of this exercise should be questioned in cost-effective terms. Weights may demonstrate that different components vary relative to one another, such that shell component may be heavier than a charcoal component in a given deposit, but more informative and interesting patterns are found in the variation within each component chronologically and/or spatially. Quantitative variation within one midden component may be found to correlate with a particular variation in another and this does not require the weight technique to be uniformly applied. To use the same example, a decrease in shell minimum numbers can be effectively compared to a coinciding decrease in charcoal weights.

Shell taxa recovered are shown in Tables 2 and 3. Diagnostic elements for oysters (Saccostrea sp.) included the left valve (or "lid") with more than half the adductor muscle scar visible, and whole umbones of the right convex valve (Black 1972:46-47). These were counted separately and the greater number taken as the MNI for each excavation unit. The number of individual whelks (Pyrazus sp.) was estimated using spires and apertures as diagnostic elements (Black 1972:60-62; Coleman 1981:300). The greater number of these two elements was then added to the number of whole whelks for each excavation unit. The umbo and hinge section of cockle (Anadara sp.), mussel (Trichomya sp.) and pipi (Donax deltoides) shells were examined for left or right orientation and the greater number of left and right valves in each spit determined the MNI for these taxa. Varying numbers of non-economic shells were present throughout the deposit. These included very small littorinids and limpets.

The miniscule amount of animal bone present in the squares analyzed was so fragmented that in the main it was not possible to distinguish its origin. Weights for recovered bone are presented in Table 4. One tooth of a terrestrial vertebrate was found in X.U. 5 of Square A (Table 4), and a mandible (with teeth in situ) of a terrestrial vertebrate recovered from X.U. 2 in Square E (Table 4). These await further identification. Stone artefacts were to be classified according to Hiscock's (1984:128-29) criteria, but only a small number of flakes (4) were recovered (Table 4).

Non-artefactual stone (rubble) was present throughout the deposit. Charcoal weights are also presented in Table 4. Metal and glass objects were recovered from the uppermost three excavation units (mean depth approximately 12cm).

Table 2. Shell MNI Hope Island Square A.

X.U.	COCKLE	MUSSEL	OYSTER	VELAC.	PYRA.	PIPI	TOTAL
1	5	0	289	11	12	1	318
2	4	0	408	13	13	0	438
3	3	0	571	20	20	0	614
4	2	0	542	26	7	0	577
5	6	0	451	11	6	1	475
6	15	2	307	6	7	0	337
7	10	0	484	3	2	1	500
8+	52	0	580	4	10	1	647
9	122	0	400	5	34	0	561
10	153	0	493	3	69	0	718
11*	225	4	458	10	51	3	751
12	106	12	351	2	26	0	497
13	113	17	606	5	26	0	767
14	104	8	364	4	8	0	488
15	89	9	297	3	15	0	413
16	60	2	123	7	11	1	204
17@	39	0	64	0	3	0	106
18	24	1	27	0	19	0	71
19	11	0	29	0	6	0	46
20	4	0	49	2	1	0	56
21	1	0	12	0	1	0	14
22	1	0	6	0	0	0	7
TOTAL	1149	55	6911	135	347	8	8605

VELAC. = Velacumantis sp.; PYRA. = Pyrazussp.

\+ = dated at 2600±80 b.p.
* = dated at 3720±70 b.p.
@ = dated at 4350±220 b.p.

Table 3. Shell MNI Hope Island Square E.

X.U.	COCKLE	MUSSEL	OYSTER	VELAC.	PYRA.	PIPI	TOTAL
1	1	1	141	3	0	0	146
2	0	1	238	6	7	0	252
3	1	0	282	5	8	0	296
4	0	1	437	34	4	0	476
5	0	4	500	39	2	0	545
6	0	4	575	27	0	0	606
7	0	1	494	31	2	0	528
8	0	2	550	43	0	0	595
9	1	2	481	36	4	0	524
10	0	0	356	25	13	0	394
11	0	0	364	35	14	0	413
12	0	0	485	47	7	0	539
13	2	0	190	14	4	0	210
14*	3	0	149	3	7	0	162
15	0	0	6	0	0	0	6
16	0	0	3	0	0	0	3
17	0	0	0	0	0	0	0
TOTAL	8	16	5251	348	72	0	5695

VELAC. = Velacumantis sp.; PYRA.= Pyrazus sp.
* = dated at 1500 ± 80 b.p.

Table 4. Other excavated material, Hope Island.

	SQUARE A				SQUARE E			
X.U.	DEPTH BELOW SURFACE (cm)	CHARCOAL (g)	BONE (g)	OTHER	DEPTH BELOW SURFACE (cm)	CHARCOAL (g)	BONE (g)	OTHER
1	3.8	8.9	0.8		6.8	24.3	0.6	Metal objects
2	6.8	3.7	2.0		12.0	22.3	0.7*	
3	12.3	4.1	0.5		16.0	12.9	5.8	Glass
4	14.5	9.6	0.7		21.8	9.6	1.2	
5	24.8	9.0	0.8+		27.5	17.5	0.1	
6	28.3	5.7	1.0	3 flakes	36.0	15.0	0.9	
7	32.5	4.1	1.4		38.8	16.8	0.4	
8	35.0	3.6	0.7		43.8	9.6	0.3	
9	40.3	2.5	0.3		48.3	20.8	0.5	
10	44.3	3.1	0.7		52.8	10.9	0.5	
11	49.0	3.9	0.3		58.3	18.0	0.1	
12	52.5	2.0	0.4		65.0	9.0	0.1	
13	55.3	7.1	0.5		70.5	2.6	0.0	
14	60.5	1.5	0.0	1 flake	77.8	1.3	0.0	
15	64.5	2.4	0.1	Red ochre	86.5	0.7	0.0	Red ochre
16	71.5	1.0	0.0		93.5	1.6	0.0	Red ochre
17	75.0	1.4	0.0		96.0	0.0	0.0	
18	79.5	1.7	0.0					
19	85.0	0.9	0.1					
20	89.5	2.0	0.1					
21	96.5	1.7	0.0					
22	102.8	0.6	0.0					

* = Mammal jaw bone; + = Tooth

CHRONOLOGY

Four samples of charcoal were submitted to the N.W.G. Macintosh Centre, University of Sydney, for radiocarbon dating (Table 5). Due to financial constraints we were forced to make judgments which would hopefully answer some questions concerning chronology, but would inevitably leave others open for future speculation and/or resolution. For example, there is a clear and coherent sequence revealed for Square A, but it lacks one or more dates from near the surface of the deposit. This information was sacrificed in order to obtain at least a near-basal date from Square E. In addition, the presence of metal and glass objects in the top 12cm of the excavation dates at least that layer to the European period.

Table 5. Hope Island Radiocarbon Dates.

SQUARE/X.U.	DEPTH BELOW SURFACE (cm)	AGE b.p.	LAB/NUMBER
E/14	78	1500±80	Beta-20800
A/8	35	2600±70	Beta-20797
A/11	50	3720±70	Beta-20798
A/17	75	4350±220	Beta-20799 *

* Small sample given quadruple normal counting to reduce attendant high statistical error.

For both squares we submitted charcoal samples which were the deepest available in amounts required by the dating laboratory. Their provenances are shown in Figures 3 and 4. Shell midden material continued in relatively small quantities below these near-basal dates. It would be our hope that once the marine reservoir effect (e.g. Head et al 1983; Bowman 1985) is known for this area, further dating can be undertaken on shell material from these lower levels.

SHELL DISCARD AND MIDDEN ACCUMULATION

Many shell middens from the southeast coast of Queensland (e.g. Alfredson 1983; Hall 1984; Hall, et al 1987; Nolan 1986) share an interesting attribute of shell middens on other parts of the continent (cf. Bowdler 1976; Meehan 1983): changes in the frequency of molluscan species discarded through time. Hope Island is no different in this regard. For present purposes we consider shell **discard** to be the number (MNI) of shellfish recovered per unit volume of deposit, and **accumulation** to be the volume of deposit per unit time. Deposit consists of such quantified items as shells, bone, etc., as well as matrix materials such as ashy fill, sand, etcetera.

Table 2 shows that shell discard in the area of Square A began in X.U. 22 at a mean basal depth of some 103cm (see also Table 4). This level presumably relates to the middle Holocene (see below). Discard increased sometime around 4,000 years ago to a rate which was sustained virtually until that area of the site was no longer used. From about 4,300 b.p. to about 2,600 b.p. midden creation in the area sampled by Square A was dominated by oyster discard, but cockles, whelks and, to a lesser extent,

mussels also figured in a numerically meaningful way (Table 2). Oysters accounted for 60% to 70% of the shellfish MNI during this period (Table 6). After this time the diversity of shell discard declined rapidly. The MNI of oysters as a percentage of total MNI after ca. 2,500 years ago is 90% or more (Table 6). Nevertheless, is it interesting that there is only a very slight drop in overall shellfish numbers in this square. As shown in Table 7, the total number of shellfish individuals in Square A after 2,500 b.p. is 3,906, against the 4,399 discarded between ca. 2,600 b.p. and 4,300 years ago - a decline of less than 10%. The most recent 2,500-year period does show an increase in overall oyster discard of some 15%, though as shown in Table 2, when broken down into individual Excavation Units, any increase is not markedly obvious. In addition, allowance has to be made for analytical factors related to the arbitrariness of spit boundaries. One way of doing this is to smooth these numbers even more by use of moving averages.

Table 8 presents moving averages of oyster MNI for 5-spit blocks, and indicates that the rate of oyster discard remained fairly constant throughout the four thousand years under consideration. Thus, in sum, shell discard in Square A declined only marginally (<10%) after 2,500 b.p., while the dominant taxon, oyster, showed a slight overall increase and a reasonably steady rate of discard. The very slight decline in Square A shell numbers after 2,500 b.p. coincides with a decrease in discard of taxa other than oyster. The bulk of midden deposit dating to pre-2,500 b.p. in Square A lies in the layer of grey ashy sediment, while the more recent deposit lies in a matrix of grey sand (Figure 3).

Table 6. Hope Island Oyster MNI as % of Total Shell MNI

X.U.	SQUARE A	SQUARE E
1	90.8	96.5
2	93.1	94.4
3	92.9	95.2
4	93.9	91.7
5	92.8	91.7
6	91.0	94.8
7	96.8	93.7
8	89.6	92.4
9	71.3	91.7
10	68.7	90.3
11	60.9	88.1
12	70.6	89.8
13	79.0	90.4
14	74.5	91.9
15	71.9	100.0
16	60.2	100.0
17	60.3	
18	38.0	
19	63.0	
20	87.5	
21	85.7	
22	85.7	

Table 7. Hope Island Square A Shell Discard

X.U's	TIME PERIOD	MEDIAN OYSTER MNI	MEAN OYSTER MNI	MEDIAN ALL SHELL MNI	MEAN ALL SHELL MNI	TOTAL OYSTER MNI/XUs	TOTAL SHELL MNI/XUs
1-8	0-2500	468	454	488	488	3632	3906
9-16	2600-4300	382	387	529	550	3092	4399

Square E revealed a near-basal date of 1,500 b.p. (Table 5). Whelks are present in this square, but the cockles and mussels which declined and disappeared in Square A after 2,600 b.p. are absent (Table 3). Oysters are the dominant taxon and, with the exception of two spits in the high eighties, they always comprise over 90% of the total shellfish MNI (Table 6). This is an attribute Square E shares with the upper (post-2,600 b.p.) layer of Square A. Virtually the entire deposit in Square E lies in a grey sand matrix (Figure 4), another attribute this deposit shares with the upper layer of Square A. Square E represents a period of relatively intense and relatively recent shell discard. The number of shells present in this square more than accounts for the very slight decline in numbers from the upper layer of Square A.

Table 8. Hope Island 5-Spit Moving Average of Oyster MNI.

EXC.UNIT/SQUARE	SQUARE A	SQUARE E
1		
2		
3	452	320
4	456	406
5	471	458
6	473	511
7	444	520
8	453	491
9	483	449
10	456	447
11	462	375
12	454	309
13	415	239
14	348	167
15	291	
16	175	
17	108	
18	58	
19	36	
20	25	
21		
22		

IMPLICATIONS FOR CHRONOLOGY

More complex chronological interpretations emerge when these matrix attributes are considered in association with the available dates. A graph of age against depth is presented in Figure 5, the radiocarbon dates being augmented with a point marking the depth of European age material (shown as an open circle). If the curve given by the Square A results is extrapolated backwards in time, it would date the beginnings of midden deposition in the Square A area of the site to about 5,000 years ago (Figure 5). First occupation of the site would seem to coincide with a cluster of dates for the earliest occupation of a set of rockshelters in the southeast Queensland hinterland which were presumably used by Kombumerri and their neighbours (Hall 1986:100; Morwood 1986:117-118).

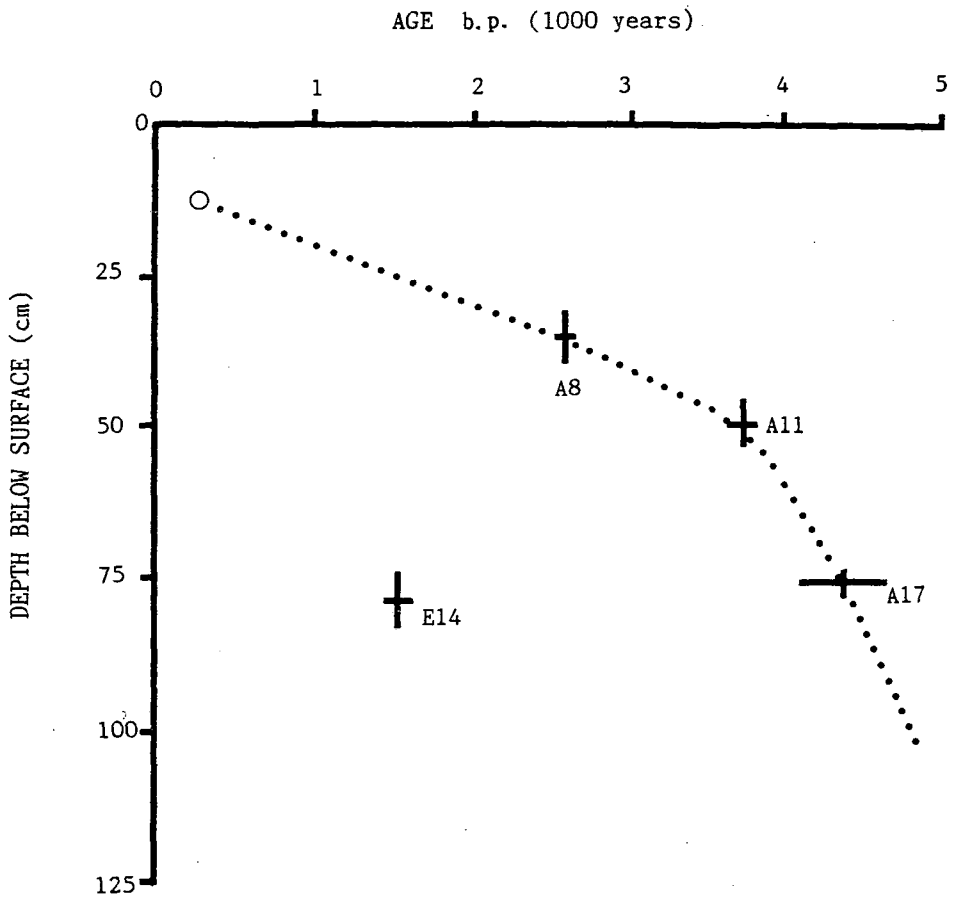

Figure 5. Graph of age against depth for Hope Island Site (modern material shown by open circle. Line drawn by eye).

The line of best fit for ages and depths in Square A shows that a date of about 1,500 b.p. would be expected at around 25cm depth in that square; in other words, in excavation unit 5 or 6 (Figure 5). At about 1,500 b.p. deposition began near the present river bank (represented here by Square E). This means that the uppermost 5 or 6 excavation units in Square A should be contemporaneous with the Square E deposit. The two units certainly share a sandy matrix character and similar distributions and abundances of shellfish taxa. This expectation may be tested by further radiocarbon dating.

Accumulation in Square A slowed down at or just after 3,500 years ago, and continued at this slackened rate until the European period. However, after 1,500 b.p. this rate is augmented by the addition of discard and accumulation in Square E, which means that overall rates increase markedly (Figure 5). Summation of the data from Squares A and E reveals that after 2,600 b.p. shellfish discard more than doubled: the combined total shellfish MNI before 2,600 years ago is 4,399; the combined total after that time is 9,601, an increase of 120%. The bulk of this increase is due to the post-1,500 b.p. Square E contribution. Whether the pattern is due to increased landscape, or more particularly, seascape productivity as suggested by Hall (1986:99), or whether it is due to increased social production (e.g. an intensification as proposed by Lourandos 1983) is unclear. It is more than mere intra-site shifting of discard areas, though that is almost certainly involved as well. For the Square E part of the site is not only newly-used after 1,500 b.p., but is used at a rate which outstripped what was going on in the Square A area.

Furthermore, the date of 1,500 b.p. from a layer near the present high water level of the river would indicate that the Square A area of the site which is higher up the present bank, was first occupied at a time of higher river level. It has been argued that following the mid-Holocene high stand, sea level in coastal southeast Queensland dropped sometime around 3,000 years ago (Flood 1980, 1981, 1984). If the 1,500 b.p. date at Hope Island marks the first occupation of a river bank newly exposed by receding waters, it implies that the drop in level of the Coomera River at least, was much later than Flood (1984) thought. The site is continuously occupied up until 1,500 years ago, and there seems no reason to expect anything other than that this Square E area of the site would have been utilized as soon as it was exposed. We therefore suggest a drop in river level at about 1,500 b.p. It must be noted however, that Chappell (1982) has argued that sedimentary budgets are more important than sea level changes in explaining certain coastal progradations in the late Holocene. The drop in water level of the Coomera River could be a function of increased sedimentation rather than a sea level drop. Whichever proves the correct explanation, this study has at least dated its occurrence for Hope Island.

Other interesting archaeological possibilities present themselves. There are virtually no recognizable bones in the deposit despite good alkaline pH conditions throughout. The site was not a place of fish discard. Fishing in Moreton Bay and in the southeast Queensland coastal waters generally does not seem to have begun in earnest until late in the archaeological record (Walters 1987). This means that if this pattern extended to Hope Island it is no surprise that fish remains were not recovered from most of the deposit. However, it is surprising that they were not found in the most recent layer. There could be many reasons for this lack. For example, it may have been cultural practice for the Kombumerri at that time to burn their fish bones, or dump them back in the water, practices which are known from other times and places on the Australian continent. In addition, the site may have been a women's site where shellfish were gathered, cooked, eaten and discarded while women's business was carried out. Given that men held the prerogative over fishing in this area at the time of invasion and earlier (Walters 1987), such a site would not be expected to contain evidence of fishing. The virtual absence of stone artefacts, material culture items largely produced and used by men, also supports such an interpretation. Nevertheless, we can only speculate on such cultural factors. There is another possibility; although the site was occupied around 1,500 years ago (and presumably more recently as well)

it may be that it was abandoned some time between say 1,200 b.p. and 900 b.p. As fishing at many other sites in southeast Queensland was set in train at or after this time, it could be that the Hope Island site was abandoned before serious fishing got under way in the area. The presence of metal and glass objects in the upper three Excavation Units of the site implies that if the layer represented by Excavation Units 5 and 6 in Square A dates to about 1,500 years, and if the top three spits represent post-invasion times, it may well be that spit 4 marks the only evidence of the most recent prehistoric occupation of the site. This would support the notion that the site was occupied for only a relatively short time, perhaps a few hundred years, after 1,500 b.p. Such a speculation may be tested by further radiocarbon dating.

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The University of Queensland provided a vehicle for travel to and from the excavation, as well as equipment and laboratory facilities. Mike Gore allowed us access to the development area, and in addition funded parts of the research costs, including the provision of dates.

Our sincere thanks to all Kombumerri owners who were willing for this research to be performed upon material which is important to their heritage, and in a location which is not only significant, but which remains, despite views to the contrary, really theirs.

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