CENTRE FOR ARCHAEOLOGY

WILYAH MIAH

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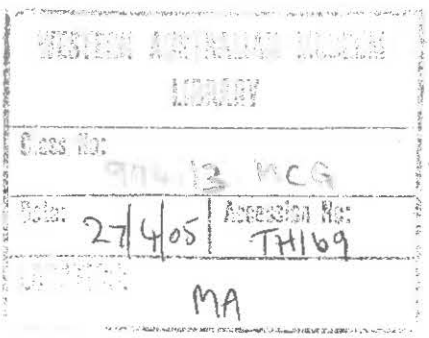

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AN ARCHAEOLOGICAL STUDY OF THE HISTORY OF THE SHARK BAY PEARLING INDUSTRY 1850-1930.

INTRODUCTION

Pearling in Western Australia was an important part of the European colonisation of the North West. Although it was never considered a permanent part of the state economy, pearling, with its immediate returns, allowed pastoralists to establish stations and contributed to the foundation of several towns. Some of these towns evolved into centres for agriculture and tourism and some developed their port facilities. Others did not outlive the availability of and market for pearlshell. Uniquely, Shark Bay not only survived the demise of the industry, but developed into the state's commercial fishing centre. The pearling boats were simply refitted to become fishing boats (OH 2266/8) and the Bay life continued (see plates three and four).

Shark Bay must be considered separately from the rest of the Western Australian Pearlshell Fisheries. The species of shell is different, the technology used to harvest the shell was different and the history of the Bay is, perhaps consequentially, different to that of the rest of the state. For this reason my study has concentrated on what is believed to be the unique nature of the archaeological record in this industry. General histories of the pearling industry were thus of little use and there was no specific history written for the area. In 1991, under the direction of Sandra Bowdler

(Centre for Archaeology, University of Western Australia), The Old Pearler site was excavated as part of her Shark Bay archaeological project. In 1994, as part of this master's research, all of the existing pearl shell camps in the bay were traced and located. In 1996 one of these sites was excavated.

The initial interest in the fishery potential of Shark Bay was in the pearls. Shark Bay yields the species *Meleagrina imbricata* which has smaller shell than the *Meleagrina margaritifera* of the North-west. The pearls are small and darker or golden and although marketable they never attracted the prices of the North-west product. The *M. imbricata* shell, although not used in the manufacture of general goods, was suitable for button manufacture and there was a market for it until plastic replaced it.

M. imbricata grows in or on the sand of the bay. This allowed for the shell to be gathered by hand and therefore, initially, there was little capital required to participate in the industry. Diving equipment, large boats and skilled workers were not necessary. The only requirement for participation in the industry was a steady supply of cheap labour.

The labour used, initially, in the industry was that of the Aboriginal people. Pastoralism ensured the destruction of the traditional Aboriginal economy and forced them to provide for the market the only commodity available to them, their labour. When the colonial authorities legislated to protect them from exploitation and mistreatment the first Malays were brought in from Alor and Solor by Captain

Cadell to work the Shark Bay banks. The pearlers then began importing Chinese labour in the 1870s.

Middens comprise the major portion of historic archaeological material in the bay. The aims of the project were designed to extract the maximum amount of information from the middens, as follows.

1) To elucidate the earliest period of the industry, that of the 1850s to 1880s.

2) To investigate the visibility of the various ethnic groups that were involved in the industry in the archaeological record. As sojourners participated to a large extent in the Shark Bay Pearl Fishery, it was planned to examine the effect that they may have had on the industry and whether they retained their cultural preferences in the face of European capitalist institutions. According to Hardesty (1985:214), European settlers arrived at intended industrial areas with ready made social and material norms. The extent to which imported labourers were expected to conform to these standards is variable, as are the efforts on the part of the Europeans to accommodate the labourers material needs and alien culture.

3) To examine the living and working conditions of the pearlers with regard to Gibbs' argument that the intended degree of permanence effects the conduct and settlement of frontier areas (Gibbs 1995:318). As Shark Bay evolved from a short term seasonal operation based on imported labour to a settlement with a resident population and local labour, this is the perfect area to test the contention that settled populations protect and improve their surroundings.

4) To investigate the visibility of the women in the industry. Women and children are apparent in the historical records from 1883. There is little opportunity to study

the archaeological record before and after families arrive as it appears that they may have been in the industry from the beginning but it may be possible to observe their increased presence in the archaeological record.

5) To describe the evolution of the industry with regard to frontier theory.

Hardesty's (1985) frontier theory is used as a descriptive tool in order to document the change in the Bay from extractive industry to settled periphery.

The archaeological remnants of the industry include pearlshell middens and very little structural evidence. When the industry finally died the building materials used in the construction of the camps were recycled, presumably now forming part of the township of Denham or found on the various stations around the Bay. Rumour has it that one of the original pogey pots is now on display at the clubhouse of a Denham sporting group.

The middens consist of pearling refuse and artefacts. The beaches where they are situated are distinguished by a mound of the nacreous pearlshell easily recognisable in the coastal glare. From maps available in the historical records (see below) and provided by Michael McCarthy of the Maritime Museum it is apparent that there were sites located at Cape Leseur, Monkey Mia, Big Lagoon, Egg Island Bay, Cape Rose, Gregory Rocks, Cattle Wells, Tardies, Middle Camp, Middle Bluff, Mick's Camp, Mangrove Creek, Top Sandhill, Wellbank, Thomas's, Chacha Narghooda, White Bay, Sunday Island Bay, Cross's Camp, Wilyah Miah, and Tumbledown. These areas were inspected during a survey in 1994 and the results are summarised in

chapter five. Some of the named areas have no visible evidence of pearling activity but it is possible that the surface material is covered by the mobile dunes characteristic of the bay.

Eight pearlshell middens were recorded, seven severely eroded middens were observed and six areas that have potential sub surface material were noted. One of the areas that the historical sources indicated would contain the remains of pearling camps was found to have no pearl shell material at all and was also found to be completely unsuitable for a pearling operation. A further two sites, Gus's and Henfry's, which were supposed to exist near Clough's Bar on the eastern and western sides of Useless Inlet respectively, are no longer visible.

SITE NAME	***CONDITION***
Cape Leseur	*Fair*
Mick's Camp	*Eroded*
Middle Bluff	*Good*
Big Lagoon	*Potential*
Cattle Wells	*Potential*
South Gregories	*Non-existent*
Cape Rose	*Potential*
Monkey Mia	*Good*
Herald Bight	*Fair*
Wilyah Miah	*Good*
The Old Pearler/Yankee Town	*Good*

Raffles Bay/South Camp	*Potential*
Gavin's Site	*Good*
Cosy Corner/Tundenerra	*Potential*
Pam's Site/ Mangrove Bay	*Eroded*
Useless Inlet 2/ Thompsons Camp	*Eroded*
Dennis' Site	*Eroded*
Ant Island	*Eroded*
Useless Loop South	*Eroded*
Gus's Camp	*Non-existent*
Henfry's Camp	*Non-existent*
Homestead Site	*Eroded*
Notch Point/ Egg Island Bay	*Potential*

TABLE ONE: Pearling sites in Shark Bay.

From this survey one site was chosen for excavation in order to gain material to compare with the Old Pearler Site, excavated by Bowdler in 1992. This site was chosen on the basis of age, preservation and apparent intra-site variability. Because the pearling middens are composed of various species of shell due to the use of the dredging baskets, the proportion of non-economic to economic shell was compared to demonstrate the change in methods over time. Economic shell is defined as that which is the target of the pearl shell fishery, non-economic shell as the environmental casualty of the pearling methods. It is contended that a change in the proportion of non-economically useful shell species in the midden over time will

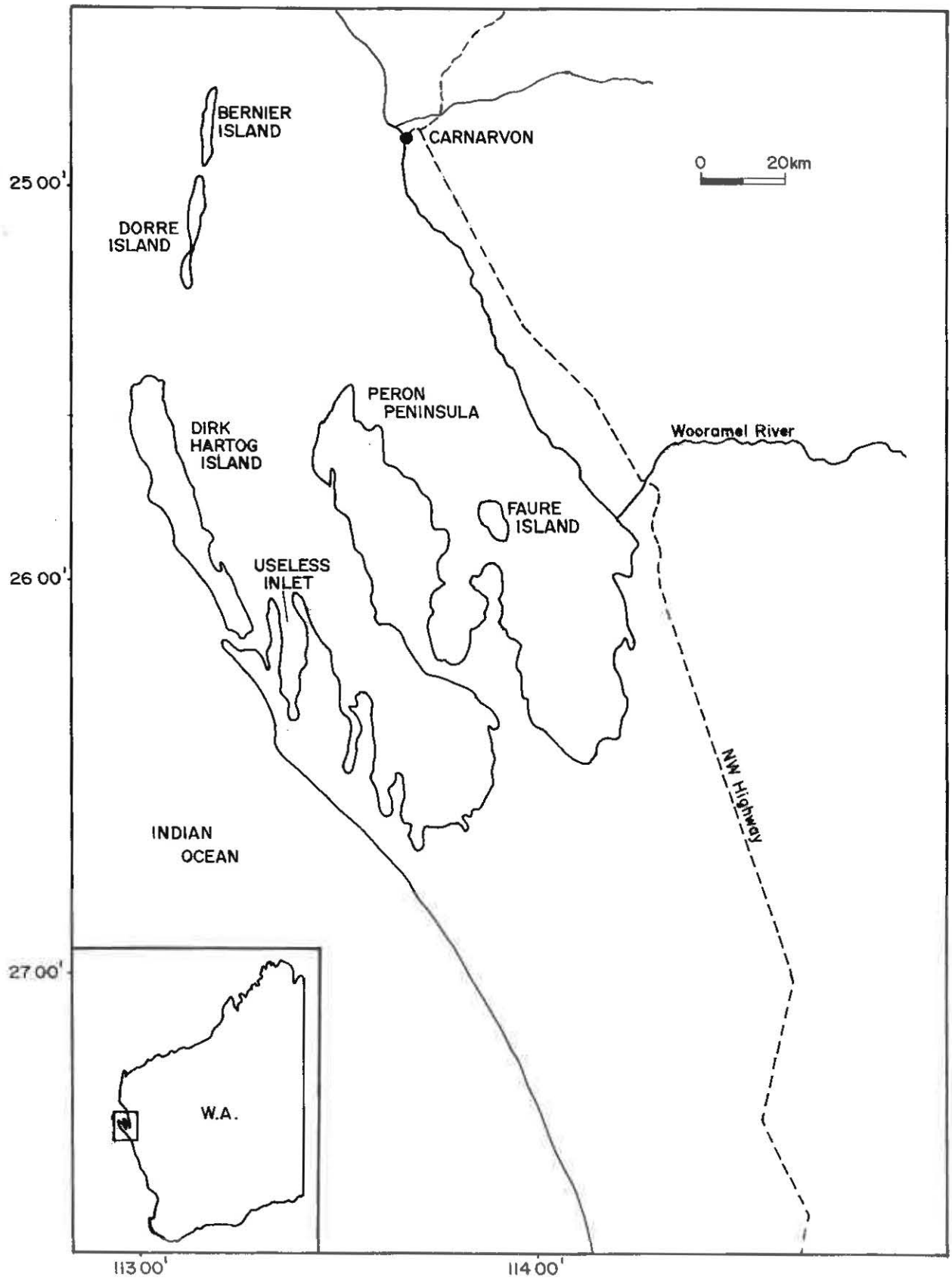
indicate a deliberate, conscious change to a more or less environmentally damaging form of pearl shell collecting.

Artefactual material was divided according to South's (1977) categories with some modifications. Yentsch's (1991) modifications to these categories were also observed in order to gauge the usefulness of this system in the recognition of women in the archaeological deposit, and, it was hoped, to illustrate their presence. Exotic objects were sought to investigate the ability of the indentured labourers and non-European pearlers to procure material goods from their country of origin. It is also considered useful to test the visibility of known sojourners in the archaeological record.

LOCATION OF THE STUDY AREA.

Shark Bay is on the semi-arid Central Western Coast of Australia (Slack-Smith 1990:129). It is a shallow embayment with an average depth of approximately 10 metres (Butcher et al 1984:2) and has a large intertidal range (Black et al. 1990:146). The bay is demarcated by Dirk Hartog, Bernier and Dorre Islands, and Edel Land and Peron Peninsula (Playford 1990:14) (see map one).

It has a semi-arid climate reaching maximum temperatures of 36.7 degrees in January and minimum temperatures of 9.9 degrees Celsius in June. The average rainfall of between 200 to 222 mm annually is counteracted by an evaporation rate of between 2000 and 2200 mm annually (Butcher et al. 1984:2). There is little surface water and the availability of drinking water has always been a major factor in the human occupation of the Bay.


BERNIER ISLAND
CARNARVON
0 20km
25 00'
DORRE ISLAND
PERON PENINSULA
DIRK HARTOG ISLAND
Wooramel River
FAURE ISLAND
26 00'
USELESS INLET
INDIAN OCEAN
NW Highway
27 00'
W.A.
113 00'
114 00'

SHARK BAY

Access to the bay is gained by the roads which head east from the Overlander Roadhouse on the North West Coastal Highway. Historically, access was gained to the various camps and stations by boat or overland on various tracks that still exist. The road to Denham has only recently (1986) been surfaced and the Useless Loop road remains unsurfaced. Denham is the main town and service centre in the bay and Useless Loop is a privately owned salt mine. The original Useless Inlet track ran closer to the coast than the current track.

HISTORICAL BACKGROUND

> *...nor does it appear suitable to retain normal behaviour and speech when he wishes to terrify other men with his beard and his curses (Machiavelli 1521:1).*

A SLOW BEGINNING

The Shark Bay pearling industry was always separate from the rest of the state's pearling industry as it differed both technically and geographically. The shell beds at Shark Bay were first investigated by the colonial authorities in 1850. After a dispute between the Western Australian colonists and the Imperial government over who had the right to authorise the gathering of pearlshell, the sand banks with pearl shell were declared open to the public (Bartlett 1954:45; McCarthy 1989:221).

There is little record of the pearling industry until the pearlers Broadhurst and Cadell began importing labour in the 1870s. When, in 1871, C.E. Broadhurst applied for a Shark Bay pearling lease, L. Von Bibra was the only person listed as living in Shark Bay (McCarthy 1989:223). Captain Francis Cadell, however, had interests in the Bay and, apart from introducing 'Malay labour' to work the banks, he successfully introduced dredging to the industry in 1870. According to Russell Cooper (1997:49) in 1871 there were forty six boats engaged in pearling in Shark Bay.

Land had been released for pastoral purposes in the 1860s and Goulder (1990:9) suggests that pearling was used by the pastoralists to fund their ventures. The following is a list of the pastoralists and the date they took up land in the bay.

date	*station*	*size*	*pastoralist*
1873	*Boat Haven Loop/ Carrarang Station*	*20 200 hectares*	*Maitland Brown*
	Dirk Hartog Island		*F.L. Von Bibra*
	Booragoorda/ Hamelin Station		*C. Broadhurst*
	Faure Island		*C. Broadhurst*
1879	*Useless Loop*	*44 500 hectares*	*A. Von Bibra*
1881	*Peron Peninsula*	*20 000 hectares*	*W. Marmion & Co.*
1883	*Boat Haven and Useless Loop*	*160 000 hectares*	*J.H. Monger, W.D. Moore, A.F. Durlacher, J.M. Ferguson.*
1900	*Boat Haven and Useless Loop*	*160 000 hectares*	*W.D. Moore & Co.*

TABLE TWO: Pastoralists at Shark Bay (taken from Goulder 1990:28-29).

Marmion was involved in a merchandising business and Moore had a Fremantle store keeping business (Brown 1996:47). Both had pearling interests and it would appear that the pearlers would not have had problems in obtaining supplies from Fremantle (Goulder 1990).

The initial interest was in the pearls. Shark Bay yields the species *Meleagrina imbricata* which has a smaller shell than the *Meleagrina margaritifera* of the North-west (McCarthy 1989:223). The pearls are small and dark or golden and although marketable there were attempts to transplant *the M. margaritifera* to Shark Bay. According to Battye the pearls took on the lustre peculiar to these waters (Battye 1915:114). Another account suggests the shell failed to propagate because the young could not attach themselves to the sandy bay and were lost (FD 936/03). Modern studies have demonstrated that the high levels of cadmium in the soils of the bay floor are responsible for the peculiar form of the Shark Bay pearls (Spencer 1999:26). The *M. imbricata* shell,

although not used in the manufacture of general goods because of its small size, was suitable for button manufacture for which there was a market until plastic began to replace it this century.

Shark Bay is a shallow embayment with a large intertidal range. This allowed the shell to be gathered by hand and therefore little capital was required to participate in the industry. As mentioned above, dredging was introduced by Cadell in 1870 and this required a small shallow boat and a crew of no more than three men.

The first labour employed in the industry was that of the local Aboriginal people. Little is known of the pre-European Aboriginal people of the Bay. It is not clear whether it was the territory of the Nanda or the Mulgana people (Bowdler 1992:5) although current consensus among the people of Shark Bay is that they are Mulgana (Bowdler pers. comm. 1999). They were easily accessible and there were no expectations that they should be paid the wages of other labourers. Willingness on the part of the Aboriginal people to participate in the industry was often an issue irrelevant to the interests of the pearlers. Goods such as alcohol may have been an inducement, but, according to Anderson (1978) in her study of the North West industry, coercion was necessary and practices such as blackbirding were employed to acquire labour. The introduction of pastoralism, by its appropriation of land, ensured the destruction of the traditional Aboriginal economy and forced them to provide for the market the only commodity available to them, their labour (Hartwig 1975:32).

At Shark Bay the major pearling bank is named Wilyah Miah, which is a Mulgana term meaning 'shell place' (Winder pers. comm. 1993). This would suggest some form of Aboriginal involvement in the pearling industry. A report in the Inquirer newspaper in 1873 described the Aboriginal people leaving the pearling camp for their `annual feed of eggs and fat turtle' (Inquirer 29 October 1873). This suggests

a) that they were local and

b) that they were not entirely dispossessed of their seasonal round.

'Black birding', which usually involved removing people from their area of residence to ensure that they were displaced and therefore more willing to work, was of secondary importance in providing Shark Bay's labour force. The local people were certainly involved in the pearling industry which would suggest a certain degree of willingness on their part. The presence of pastoralism, however, probably left them with limited choice.

There is evidence to suggest that blackbirding was a sideline industry and that the local Aboriginal People provided a labour pool for the North-west (Inquirer 1 March 1876). These people would have been displaced but already familiar with the sea. So it would appear that the local people provided both a labour pool for the pearling industry and a saleable commodity for those wishing to share this labour pool with pearlers of the north west.

In 1876 the Acting Colonial Secretary, Fairbairn, while investigating the Shark Bay region, was told that Aboriginal People were being kept on Faure Island. He found evidence of Aboriginal people having been on the island. On the coast nearby he

found two European men camped who were then accused of 'blackbirding' (Inquirer 1 March 1876). Faure Island was a pastoral lease and there is evidence that there was a small pearling operation there. This account, however, suggests that the people were stranded here with no means of getting to the mainland so that they were captive until they were required for sale or exploitation.

By 1871 the conditions under which Aboriginal people worked were bad enough to warrant legislation to protect them (34 Vict.14). This legislation was followed by more and similar legislation indicating that the problem was unsolved. The repetitive nature of the legislation indicates that the obstacle to their protection was one of enforcement (McGann 1988). The west coast is simply too large to police effectively.

An act to regulate the hiring and service of aboriginal natives engaged in the pearl shell fishery; and to prohibit the employment of women therein. (2 January 1871) was designed to "...prevent the mischiefs that arise" in the industry. The Act required that for an Aboriginal Person to be employed in the industry an agreement had to be signed and witnessed by a Justice of the Peace or Police Constable or some other appointed person. The agreement had to specify

1) The nature and duration of the intended engagement

2) The time such Aboriginal Native is to begin work

3) The amount of wages or other remuneration which such Aboriginal Native is to receive

4) A stipulation that the master or other person will duly convey such Aboriginal Native back to the place at which he was first engaged before the expiration of such engagement (34 Vict.14).

Female Aboriginals were forbidden to go on any pearling vessel, but probably accompanied the males to the industry and worked onshore (Hunt 1986). In 1873 the pearlers were still demanding a repeal of this law because it prohibited the employment of women (McCarthy 1989: 234). These demands failed and the pearlers began to look overseas for their labour.

FLOATING A PROFITABLE VENTURE

The first Malays were brought in from Alor and Solor in 1870 to work the Shark Bay banks (McGann 1988:21). People from places as diverse as Alor, Solor, Java, Singapore and the Philippine and Sulu Islands were used in the industry under the title 'Malay'. Due to their efficiency pearling turnover increased and by 1875 there were 989 Malays on the west coast (McGann 1988:58). By the end of 1873 there were between 30 and 40 boats in Shark Bay and the working population including Aboriginals and Europeans numbered approximately 200 (Inquirer 24 August 1873).

The camps of the pearling population were arranged along the east shore of Useless Harbour less than 5 miles apart. The camp of Wilyah Miah was described as stretching for eight miles along the eastern shore of Useless Inlet.

> ...there are four camps, of which the extreme are not five miles apart; they are situated near the mouth of the harbor; and water is fetched across by boats, the distance being about six miles (Inquirer 29 October 1873).

The camps consisted of tents and wooden houses (Inquirer 29 October 1873). Due to the pastoral leases, which ended 20 metres above the high tide line, the camps were arranged linearly along the beach (Goulder 1991:29).

In 1873 Shark Bay shell was sold for the first time on the market in London (Inquirer 27 August 1873). Before this no one had been prepared to endure the cost of transporting them to London and trying an untested market for the new product.

This new economic possibility produced colonial government interest in the revenue from the pearling industry and legislation was enacted to extract license fees from the pearlers (37 Vict.10). This Act required that all ships employed in the industry be licensed or be liable to fines equal to ten times the license fee which was a minimum of £5 and a maximum of £30, calculated at 20 shillings for every ton, or part of a ton, of the ship per year (37 Vict.10). An export tax of 40 shillings per ton of shell was also imposed but Shark Bay was exempt (37 Vict.10) because of the comparatively small value of the industry. By the end of the year there were complaints about the fees (Inquirer 3 December 1873) but the conditions were still good. The Inquirer commented that pearling was easy and profitable and men were flocking to the Bay (Inquirer 3 December 1873).

By early 1874 however the conditions were not so good. There were 400 people working in the Bay, which means that the population had doubled, but the shell was rapidly dwindling (Herald 7 February 1874). Hot weather, unsanitary conditions and a lack of provisions produced a deadly fever. Such a crisis prompted an exodus from

the Shark Bay Region which in turn streamlined the industry into a few larger concerns.

Aboriginal labour was still employed despite the importation of Asian labour. According to a Magistrate's report the Aboriginal people were well treated and were kept onshore. Apparently the entrapment of Aboriginal People on boats was a state wide concern in the pearling industry (Inquirer 8 October 1873) but in Shark Bay it was not a problem. This was probably due to a number of factors such as a local Aboriginal labour force and the fact that the smaller boats used in the Shark Bay industry would have rendered them useless as prisons.

The 'Malay' situation was less fortunate. Many were detained for longer than their agreed term of service. Several of the indentured labourers absconded and the pearling and pastoral population feared violence would erupt (Herald 28 March 1874). There is an account of their living conditions.

> ...at first we had rice to eat: each day I had four pannicans of paddy given me to cook for thirteen men; the paddy, when freed from the husk, only left two pannicans of clean rice, this was not enough....all we had for thirteen men was two and a half pannicans of flour, a pannican of sugar, and a handful of tea a day. When the flour was done we had to go into the bush and dig roots. (Kay in the employ of Cadell Inquirer 1 March 1872).

Other workers were more fortunate.

> Mr Hill allows them flour, rice, tea and sugar ad libitum, and fresh mutton once a week, and vegetables when procurable.....Mr Thomas ...(allows them) flour, rice, tea, and sugar ad libitum, potatoes when available, and fresh mutton occasionally.....The Malays are allowed to get their own fish, of which their is an abundant supply in the harbor. (Inquirer March 1 1872).

The Acting Colonial Secretary, Fairbairn, was sent to report on the Shark Bay industry. He found Malays formerly in the employ of Broadhurst and Cadell who had not been paid nor sent back to their homes and were in Shark Bay without support of any kind (Inquirer March 1876). Sickness, exposure and malnutrition were common amongst the men in Cadell's service. In 1875 Malay importation was seriously curbed by the Dutch authorities. According to Anderson (1978:18), the pearlers in Western Australia then returned to coercing the Aboriginal People.

There is some indication in the Colonial Secretary's report (Inquirer March 1876) that the pearlers were heavily reliant on imported food and medical supplies. As the industry appears to have been a sideline interest for the pastoralists and merchants there is reason to believe that the pearlers had access to livestock and goods from Perth and were dependent on them. There is very little evidence to suggest any attempt to utilise the resources available in a way which would suggest an effort to learn from the Aboriginal people. Goulder (1990) in her sociological study of the Bay notes that the current inhabitants have very little affinity with the natural resources of the Bay except for those used for commercial purposes, namely guano, pearlshell and fish (Goulder 1990).

The pearlers began importing Chinese labour in the 1870s as Malay labour became difficult to procure. Because pearling was of little benefit to the colony, generating 6% of total export earnings compared to 53% from the wool industry, there were no government funds provided for this venture (Atkinson 1990:26). It appears, however, that the pastoralists may have used the labour intended for the wool industry for their pearling interests. The pearlers also privately imported Asian labour through

commercial "coolie agents" (Atkinson 1990:26). As with the indentured 'Malays', colonial legislation ensured that this labour was closely monitored and returned home after the term of service. The Western Australian authorities had no interest in the Chinese as permanent settlers.

In 1880 there was an investigation of the pearl shell fisheries of the colony. A committee was appointed by the Colonial Authorities to look at means to protect the shell beds from exhaustion, but the terms of reference also suggested concern for the workers in and the revenue from the industry (CSO 1282 1880; Votes and Proceedings of the Legislative Council a2 1880). Because of this investigation part of the shell banks were closed for 5 years although after 4 years considerable commercial pressure reopened them (Government Gazette#49 1884; CSO 1182/85). It was also recommended that any exported produce should be taxed rather than continuing the unpopular tonnage dues on boats.

This committee recorded the loss of lives and vessels between 1873 and 1879. The causes of death were not listed but new regulations released in the Government Gazette contained specific instructions for the care of the Aboriginal labourers (Government Gazette 8 December 1880). One can only infer from this direction that malnutrition, exposure and inadequate medical attention were prevalent.

The European pearlers, however, appeared to be thriving. Jarvis Hoult stated in 1883 in a murder deposition that he was "a butcher at present ...storekeeping in Sharks Bay", as was George Cross. These two were brothers-in-law and possibly involved in

the same business, but it is an indication that there was at least one store and fresh meat available.

By 1886 Chinese entrepreneurs had invested capital in the Shark Bay Pearl Shell Fishery. This involvement coincided with a decline in the pearlshell for which the Chinese were held responsible by the European pearlers (Goulder 1990:26; PD June 30 1886:54). This assertion was plainly false as dredging does not discriminate on the basis of size or species of shell and, except in so far as the presence of the Chinese added to the number of people working the banks, dredging was clearly the cause of the environmental exhaustion. The competition for shell, however, produced rivalry among the different ethnic groups. The Chinese were self-employed and were numerous enough not to have to assimilate (Goulder 1990:27) and this made them the obvious targets for prejudice. There were approximately 200 people in the bay in total, 60 Europeans, 102 Chinese and 68 'Malays' (McGann 1888:111b). The Chinese, however, controlled only 7 of the 68 vessels in the Bay (McGann 1988).

The Europeans formed an association (the "European Association") and sent a delegation to Perth to ask the Colonial Authorities that the Asians be excluded from the pearling. This was achieved by the granting of an exclusive license in the waters of Shark Bay. The colonial government was particularly interested in the revenue that could result. One parliamentarian wanted it specifically stated in the bill that the Chinese should be excluded from the pearling banks but this was avoided for fear of embarrassing the Imperial Authorities. The Governor stated that

> ...the European colonists at Sharks Bay are entitled to consideration, and that the pearling banks should be leased to them, when the necessary law has

> been obtained. Tenders for the lease might be invited; but I submit it would be against public policy to accept a tender made by Chinese. (PD July 7 1886:82)

In 1886 the Chinese Association submitted a tender of £1351 and the European Association a tender of £1000. The European offer was accepted and the Chinese engaged the solicitors Stone and Burt to petition the government (CSO 3406/86; 4430/86; 4439/86). They claimed that they could not dispose of their equipment and that they could not work for the European pearlers (CSO 4430/86). After a protracted period of negotiations during which the government representative was a police constable and a contingent of policemen were sent to Shark Bay to prevent violence, the Chinese accepted the sum of £1000 as compensation for their equipment (CSO 4640/86; 4441/86). This was conveniently less than the revenue from the lease and £500 less than that requested by the Chinese. Sale of the equipment raised only £244 which the police representative in charge of the proceedings attributed to the lack of money at Shark Bay (CSO 197/87). Atkinson (1981) concludes that this episode was a limited victory for the Chinese, although they were forced from the industry they were, in part, compensated for their loss.

After this the Chinese who remained were labourers only (Von Bamberger 1980:75) and were no longer a commercial threat to the European Association. The European Association then divided into two classes.

> 1 Master Pearlers who owned boats, paid fees, held positions in local government and children intermarried.

2 Bachelor Labourers

(Von Bamberger 1980).

It is not clear where the other ethnic groups fitted into this new order but it is unlikely that they held positions of importance or owned boats. Also until relatively recently, that is late this century, Denham was divided into areas for the purpose of ethnic separation (Fossa pers.comm. 1993). It could be suggested that the non-Europeans formed a labouring under class. Aboriginal people were not allowed to own boats or leases. The process of dummying, which consisted of a non European pearler using a license obtained under the name of a European pearler, continued, although for the most part the ethnic minorities and indigenous majority formed a labour pool for the boat owners.

Reynolds (1990:195) suggests that geographic separation protected the interests and privacy of both employer and labourer. In Shark Bay, the local Aboriginal people who were not employed in the industry were discouraged from visiting those that were engaged in pearling. Separate camping areas (Police Occurrence Books[1]) on top of, or behind, the dunes allowed the Aboriginal people the privacy to entertain their 'bush' friends and observe religious practises. Separation also allowed the labourers to indulge in forbidden activities, such as consuming liquor (Police Occurrence Books).

[1] Police Occurrence Books are the daily log from the various police stations operating in Western Australia. These are particularly useful when considering the camp locations because the police at Shark Bay routinely checked the camps and recorded these visits. Also, Aboriginal people are more visible in these records because of the government restriction of the sale of alcohol to this group. This information is summarised in the appendix.

THE INDUSTRY TAKES A DIVE

Price movement was rapid and there is a general boom era recorded in the export returns until 1892. In this period members of the pearling association tried to exclude newcomers from the good fortune. Moore (1993) claims that the environmentally exhausting system of dredging had once again depleted the banks. This time the new arrivals from Perth, the European bachelor labourers, were the focus of blame. The Shark Bay population had obviously settled and developed an 'us and them' attitude to Perth by this stage. The Shark Bay industry was so depressed that in 1889 an Act was passed to reduce the export duty on pearl shell from the £4/ton stipulated in the 1886 legislation to £2 (CSO 527 - 2903/89).

Concerns were expressed about the indiscriminate use of the dredges as early as 1887. A police constable (P.C. Tribe) wrote to the colonial authorities expressing his fears that as the dredged material was not sorted before the boats reached shore the young shell was destroyed when the larger shell was collected. There was as yet no legislation of an ongoing kind to enforce the preservation of the shell stocks (CSO 1049/1889) and the pearlers felt that sorting required too much time despite the fact that collecting shell from the banks by hand was no longer possible because the banks closest to shore had already been decimated. The pearlers' response was to move to the banks near Peron Peninsula which had been closed for a period of recovery (CSO 1049/1889) (see figures three and four). PC Tribes' concerns were ignored because the resident magistrate at Carnarvon, Mr Foss, reckoned that the amount of immature shell that was removed from the water was negligible (CSO

1042/87). Foss retracted this opinion in 1889 (CSO 1049/89) and recommended that by-laws dealing with the issue be published in the Government Gazette.

Because of the environmental degradation caused by the dredging, the fishery was closed in 1892 and then a complex system of leases was introduced to facilitate the protection and cultivation of the shell. The collection of young shell was prohibited (Moore 1993:12) and the use of dredges was restricted to banks that were both healthy and accessible only by boat (CSO 527 - 210/03). The banks were closely monitored and inventories of young shell were produced by the inspector of fisheries (CSO 527 - 3246/94; 218/00). By 1895 there were 40 men, 12 white, 9 Aboriginal, and 19 Asian, involved in pearling in the Bay (McGann 1988).

Despite these precautions, in 1898 a letter in the *West Australian* newspaper stated that the industry was so depressed that in the winter months the pearlers were working as sandalwood and oyster collectors in order to live and that during the year profits had not exceeded `wages and tucker' (West Australian 27 August 1898). According to the archives the revenue remained constant or depressed until the close of the industry.

In 1898 Freshwater Camp was gazetted as the town-site of Denham. In 1889 the pearling camps had been described as 'scattered' (CSO 1672/89) although as early as 1888, and possibly even earlier, the mail had been arriving at Freshwater Camp for distribution (CSO 591/88). As the name suggests, the camp had been a source of freshwater and had become central to both pearling and pastoralism in the bay. Stores arrived at Denham from Perth by ship and the shell was sold through the

same agents who sold the stores (Fry 1989:6). According to Arthur Basset, the pearls were sold to a buyer who arrived every 3 or 4 months (Basset 1990 OH 2366/13).

Although Denham was the centre of population the banks at Wilyah Miah were still preferred because the deeper water there produced larger shell (Belotti pers.comm. 1993). Some pearlers lived in Denham and travelled to their leases spending the week on the boats, while others lived near their leases in huts around the Bay (OH 2266/38, 2266/8). The rest of the pearling industry was centred around the banks at Monkey Mia and Redcliffe Bay (CSO 527 - 3246/94; 4290/94; 218/00).

It is claimed that at this stage the pearlers made little or no more than a living from pearling (West Australian 27 August 1898) and the industry seems to have been arranged in small operations of boat owners and workers or family groups. For those directly involved in the industry it was no longer a lucrative interest. Supplying stores and housing was the more profitable option and this allowed a new form of master to develop. Until this time, master pearlers had provided capital, housing and the stores.

Pearling was supplemented by fishing and the pearlers supplied the boats that visited Shark Bay with local fish. Fishing eventually replaced pearling as the major industry in Shark Bay and control of the freezing facilities guaranteed control of the industry. Shark Bay became increasingly centralised.

In 1903 there were fourteen people holding eighteen leases in the bay (CSO 527 - 987/03) while eight other leases were forfeited by the tenants. At this time

experiments were conducted into the viability of transplanting the more profitable north-west species of pearlshell to the waters of the bay (FD - 1231/03). This procedure utilised cages lowered into the water in Egg Island Bay. It was hoped that the shells would propagate using coral reefs in the vicinity as this species could not live on the sandy floor of the bay (FD 936/03). Also, the cages would have kept the shell away from the cadmium rich sand. These experiments failed, however, and the local species continued to be harvested.

The reason for this experimentation was wholly economic. Prices for Shark Bay shell were much lower than for their Broome counterparts. By 1915 the availability of new markets had become an important issue. The outbreak of World War 1 effectively cut off markets in Germany and Austria and the shortage of labour in Europe had diverted manufacturing to the United States (FD 477 - 544/16). Also, particularly with regard to buttons, a luxury material like pearl shell was replaced by "...steel, bone or cloth." (FD 544/16). The idea of dealing directly with manufacturers had been discussed in 1907 by various entrepreneurs but the impracticality of financing and establishing warehouses and staff in Britain and the impossibility of competing with the three major firms that were already in operation proved insurmountable.

SINK OR SWIM

The idea of manufacturing buttons in Western Australia was first raised in 1907. Mr J. Falconbridge sought information on the local extractive industry as he intended, with financial backing, to manage and equip a factory in Australia. It was his intention to produce button blanks in Australia. These blanks would be a lighter and

more stable cargo than the pearl shells, thus reducing the amount of freight and breakage (CSO 1779/07).

Apparently this venture never came to fruition because the issue was not raised again until 1917. The mother of pearl shell now had to compete with cheaper imitations such as those provided by the "...shell of the trocas, green snail, Japan ear and fresh water mussel..." (FD 2389/17). It was proposed that Australia manufacture buttons rather than mere blanks and the rationale was that the profit margin would be substantial when the raw materials were purchased locally. The Department of Aborigines and Fisheries speculated on the value of the finished product and researched the idea thoroughly. Experiments were conducted at the Perth Technical School where the necessary lathes were available. The large north-west pearlshell, the Shark Bay shell and the trochus shell were all used in the operations. Both the large shell from the north west and the Shark Bay shell were cut into buttons with little difficulty and the economy of the idea was demonstrated (FD 2389/17). Apart from the practical difficulty of supplying experienced staff, the idea of producing buttons locally rather than supplying blanks to an overseas market was considered feasible.

By 1923 Messrs Brown and Dureau, of Murray Street Perth, were acting as agents for an American company which produced machinery for the manufacture of pearlshell buttons. Despite these promising, yet slow, developments, in 1926 no buttons were manufactured in Australia. The production of buttons was seen as an avenue to stabilise the pearlshell industry and government assistance was sought by the Broome Road Board and Mr Spaven of Shark Bay. The Broome Road Board finally rejected the idea after investigating the machinery required for such a project. Nothing more

is mentioned of the Shark Bay project but in 1994 button blanks and cut shells were found in archaeological contexts at Monkey Mia indicating that at the very least someone was conducting experiments in the area (see plate eight).

Pearlshell became a little used luxury and items that were traditionally produced with the shell were manufactured in the 1930s using imitations (FD 732). Only the cheapest pearlshell was sought and prices accordingly plummeted. The advent of the second world war destroyed the remainder of the Shark Bay pearling industry as it destroyed the European Market and prevented the transport of export goods by boat (Basset 1990 OH 2366/13). Despite this, leases continued in the 1930s (FD 34/35).

During 1913 Shark Bay shell realised £20 to £40 per ton in Britain, depending on quality but after the war the same shell sold for £10 on the beach or £13 in Perth or Fremantle (FD 2389/17). Ten years later this price had risen by £5 (FD 15/26). At this stage the Shark Bay pearlers asked to be included, with the industries of the North-West and Thursday Island, in the operations of the Act regarding the pooling and export of pearlshell (FD 1/27). In 1918 there were still approximately thirty boats operating in the waters of Shark Bay (OH 2266/8) and in 1929 Colebatch claimed the Shark Bay Pearl Fishery "...provides employment and support for between 50 and 100 persons with their wives and families" (Colebatch 1929:167), indicating that despite the impecunious nature of the industry at this stage, there were still people willing to participate. The only reasonable explanation for this was that they were residents and that pearling was one of the few occupations open to them.

According to Basset (OH 2261/16), vegetables were available from the steamer every three to four months. He also asserts that the pearlers grew vegetables and kept chickens and cows for eggs, milk and cheese. They supplemented this diet with wild rabbit and emu (OH 2261/16). This agrees with the material found in the archaeological record. Cow bones, eggshell and chicken bones were found at the two excavated sites. However, mutton and pumpkin were favoured in the earlier period, which corresponds with Von Bamberger's assertion that mutton and vegetables were part of the diet of the European pearlers. Von Bamberger (1980:180) also lists the vegetables that were grown as tomatoes, onions, lettuce, cabbages, red beets, peas and water melons. Unfortunately vegetables other than the pumpkin and watermelon are unlikely to be visible in the archaeological record so this part of the diet cannot be elaborated.

As the banks were depleted and the pearlers had to go further to get to them, shell collecting required week long ventures by the men to the beds at Useless Inlet and Cape Banks (OH 2266/8). During this time the shell would be sorted and cleaned by women and older children (OH 2266/8). At the end of the week a fresh load of shell would arrive (Winder pers. comm. 1993). The pearlshell was either rotted in barrels then boiled in coppers and put on bags so the liquid could seep through to reveal the pearls (Fossa pers. com. 1993) or the rotted pots (pogey pots) were topped with sea water and boiled, then the liquid poured into a trench that joined the sea. By one account the rotting process took three months which would have rendered the camps unbearably obnoxious (OH 2261/16).

PLATE ONE: Chopper Shell Machine Wilyah Miah (Courtesy WA Maritime Museum).

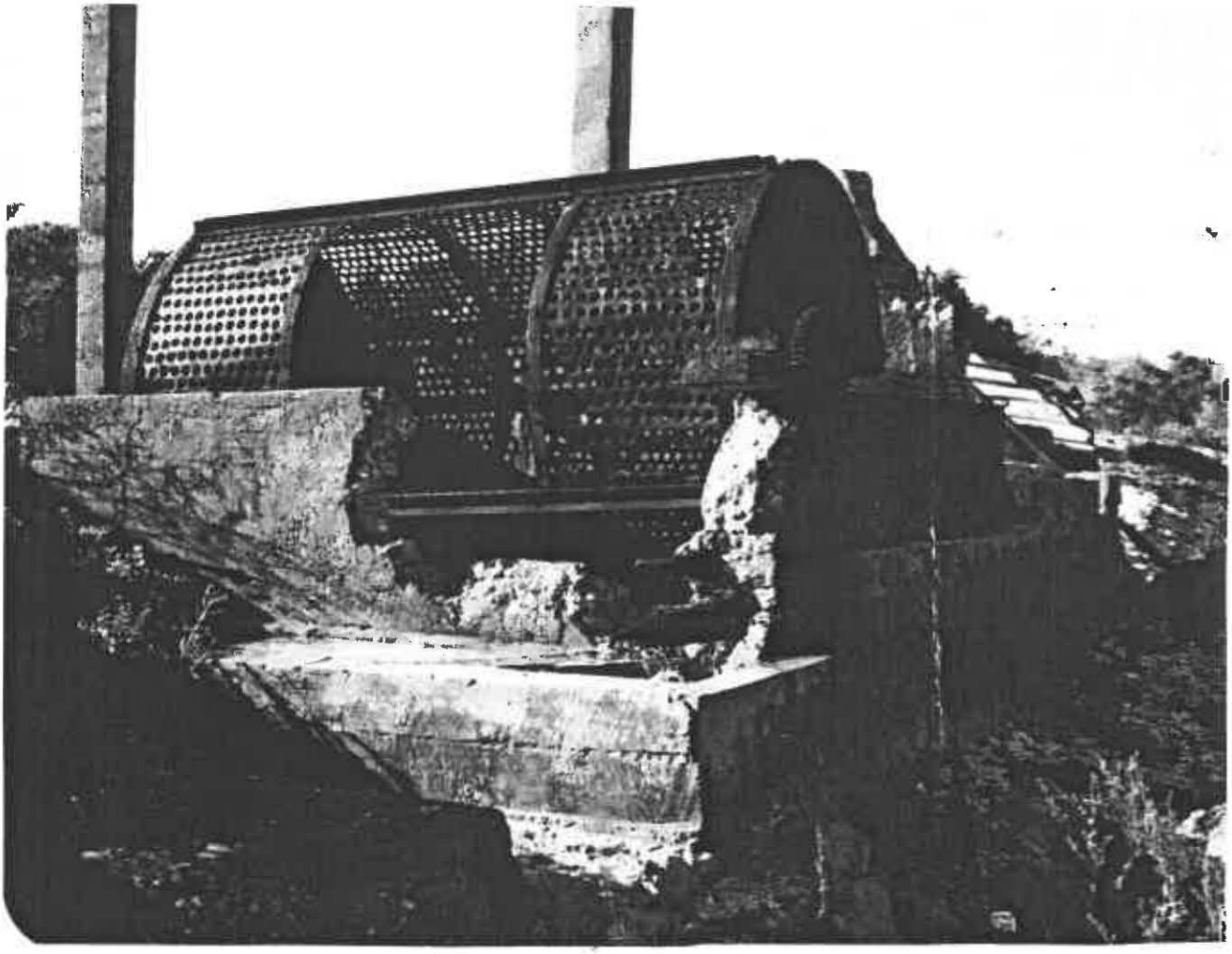


PLATE TWO: Lease pegs at Cape Rose.

PLATE THREE: Pearling boat the "Galla Curci" Denham 1993.

PLATE FOUR: Pearling boat converted to a fishing boat, the "Valsheda", Denham 1993.

According to one pearler this method of boiling revealed more pearls than merely by opening the shells. The pearls could then be picked out of the pogey pot with tweezers (Goulder 1990 24).

The shell itself was cleaned using "....a chopper shell machine made of wire netting with a handle which, when turned, knocked off lips." (Goulder 1990:23-24) (see plate) Then the barnacles were removed using a sheep shearing blade before the shell was polished with a roller (Goulder 1990:24). Only the white shell was sold, the yellow shell was discarded and it can still be seen lining Knight Terrace (OH 2266/38). These descriptions of the industry were probably also relevant to the methods employed last century.

The industrial workshops were dispersed throughout the Bay at major camps during the boom period of last century. Later, when the capital base of the industry was effectively lost, the European Association withdrew to Denham, where the sheds lined the beach and the pearlers pooled infrastructure. In the later period of the pearling industry, individual pearlers had separate leases with their own shed and pogey pots (OH 2266/38). Eventually the pearlers built their houses on their leases to be closer to the banks (OH 2266/8) and once again settlement was dispersed. The only camps with apparently continual occupation are Wilyah Miah, Monkey Mia and Freshwater Camp/ Denham.

There is very little variation in structures over time, however. Wooden structures described variously as huts or houses, and tents were established in settlements throughout the history of the bay but none of them have survived . Because the camps were arranged linearly living areas were adjacent to the industrial areas. According to May Fossa (1993 pers.comm.) Denham was arranged like this in her lifetime. Sheds and pots lined the beaches and behind this lived the pearlers and their families, where the Denham bakery and pub are now.

In 1883 a Mrs. Pontevivo was murdered while her husband was away. A young 'Creole' was tried and acquitted for the murder. Witnesses' accounts of the incident describe a well set out camp of tents, furniture, paths and domestic arrangements. The site of the murder was at Freshwater Camp, later the town of Denham.

The accounts also mention the presence of alcohol in a recreational form and some blame for the murder was attributed to its consumption. The archaeological remains from the two excavated sites, which include rum, gin, ale and wine bottles, do not dispute the suggestion of alcohol abuse. By 1889 there was one policeman stationed at the bay but the pearlers argued that this was not enough (CSO 3056/89) to combat 'sly grog selling ..and the consequent brawls which take place' (CSO 3056/89). As a result Captain J.G. Knight and E.W. Butcher were appointed Justices of the Peace.

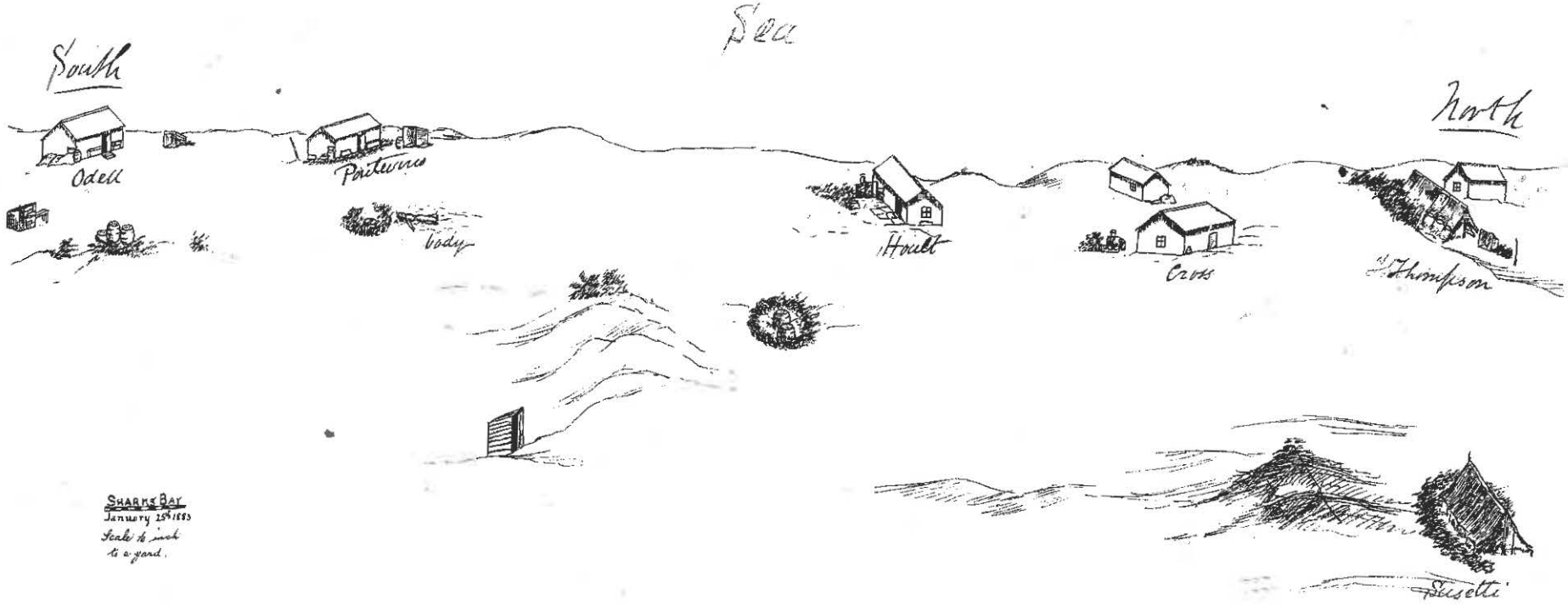
The living quarters in the 1883 sketch vary from large tents to wooden houses. The houses are depicted as simple gabled structures with a central door and one to two four paned windows(CSO CONS 527 item 1505). They were probably made of

wood and zinc. In the depositions of the witnesses in the murder case the victim's belongings are described as a cupboard, a table, a bed and a bedstead, a bottle of rum, and blinds on the windows(CSO CONS 527 item 1505). The house had a door and two windows, outside there was a well, water tubs and an external fire place(CSO CONS 527 item 1505). This victim shared her home with her husband and he was collecting sandalwood at the time of the murder(CSO CONS 527 item 1505).

The murder took place in February and this is an indication that even in the 1880s, pearling was carried out mainly in winter when the weather was safer for boating. D. Hoult (OH 2266/38) of Denham recalls his grandfather collecting sandalwood at Wooramel Station. The time of the high tides of winter was the dredging season, while the summer low tides were perfect for collecting shell on foot (OH 2266/38).

The suspect lived in a tent with at least one other male. In the deposition another witness describes sharing a tent with two other males(CSO CONS 527 item 1505). The tent of the suspect is described as having flooring boards and a bunk, which sounds less elaborate than the victim's household (CSO CONS 527 item 1505). These lists of furniture are not exhaustive or probably even complete; they are mentioned in the witness depositions only in the context of the crime and the search for evidence. Any items without bearing on the case were probably ignored.

(a)



Sharks Bay
January 25th 1883
Scale ½ inch
to a yard.

From the depositions two factors effecting the quality of housing can be inferred, firstly ethnicity, and secondly marital status. Single women of marriageable age do not appear to be part of the population of Shark Bay at this time and the married women in the depositions all live in houses. From this it can be inferred that women were only in the bay with their husbands and not as individual participants in the industry. Also only men of European descent appear to have been married. As mentioned previously the Asian labourers were not permitted to bring their families to Australia and there is no expectation that they would have wanted to. This still leaves the question, was it marital status or economic status or ethnicity that prescribed housing quality? As most of the married men appear also to be master pearlers it is contended that only those with the capital to invest in the industry and therefore to establish housing would have been in a position to bring their families. Therefore marital status was determined to a certain extent by economic status and ethnicity.

By 1905 the Bay accommodated a fisheries office which was also made of wood with a metal roof, two windows and a door, although this building boasted a raised floor and a hipped roof. Jane Winder (pers.comm. 1993), who was born at Wilyah Miah in 1892, remembers a fairly substantial camp at Willimia Point (Wilyah Miah) and "good houses". Reports of Wilyah Miah in Broadhursts' time boast wood and zinc housing for the pearlers(Inquirer 29 October 1873).

Women are apparent in the historical records from 1883. Three women, Mrs O'Dell, Mrs Cross and Mrs Pontevivo, were living at Freshwater Camp in 1883 (CSO Cons 527 item 1505) and families appear in the Police Occurrence Books in the same year. According to the historical sources there were very few women in the bay until the 1890s (Goulder 1990:33) then as the population stabilised the industry became centred around family units. There is little opportunity to study the archaeological record before and after families arrive as it appears that they may have been in the industry from the beginning but it may be possible to observe the increased number and economic importance of family groups over time in the deposit.

European women demanded a better standard of living than the bachelor establishments (Von Bamberger 1980). Sinks for water supplies and vegetable gardens were established. According to Von Bamberger (1980:73) these women wore hats, veils and long dresses and gloves. In the account of the murder listed above, the victim's clothing as described consisted of elastic boots, stockings, a dress, a night dress, chemise, a flannel petticoat, drawers, head dress (CSO Cons 527 Item 1505). This is in line with Von Bamberger's description of long dresses and petticoats, but there is no mention of gloves and veil.

Jane Winder claims that she acted as mid wife for the women of the bay (Winder 1993 pers.comm.). This was conducted in some secrecy as the practise was not condoned by the medical authorities, but Ms Winder states that as their was no formally trained medical practitioner in the bay the women had no alternative (Winder 1993 pers.comm.).

DEMOGRAPHY AND THE LABOURERS

Aboriginal labourers were, as demonstrated by the volumes of legislation enacted, bought, sold, coerced and generally mistreated.

In a murder case of 1883 Champion, an Aboriginal witness, refers to his *Mia* as being separate from the 'white pearlers Camp' (CSO Cons 527 item 1505). According to Von Bamberger (1980) the Aboriginal labourers were separated from their "bush" counterparts and there was pressure for "half-castes" not to mix with those who participated in the industry. The outsiders were not permitted to spend the night time in Denham and so had a camp three miles south of the township (Von Bamberger 1980:76). There the Aboriginal labourers were free to maintain traditional responsibilities and socialise with their extended families without European interference (Lefroy 1978:54).

The 1880 Police records portray sexual relations of an economic nature between the Aboriginal women and the pearlers (Von Bamberger 1980:71). Payment was generally in the form of alcohol, which the Aboriginal people were legally denied, and the husband usually acted as the intermediary (Von Bamberger 1980:71). Susan Hunt (1986) in her study of women in North West Australia states that

> In some cases, it was said that Aboriginal women supported the remnants of their tribes through prostitution, perhaps at the encouragement of tribal elders (1986:111).

The women in this case were probably the first to experience the alteration of their lifestyle due to European influence rather than the men in their society. This is

counter to many examples of the alteration of indigenous cultures by colonists where men were initially subject to more change than women (Deagan 1982:163).

Three burials found in 1998 at the WA Water Corporation Compound above Denham reveal Aboriginal skeletal features and Non-Aboriginal characteristics. One was revealed *in situ* in the ground facing west and another facing east but both were in a sitting position (Bowdler1998:8). The studies made by Dr Freedman of the University of Western Australia and the State Coroner conclude that the burials date to the nineteenth century and that the teeth of the skeletons have mixed Aboriginal and Non-Aboriginal characteristics (Bowdler 1998:15). Clothing relics suggest that they were buried in the late nineteenth century. Bowdler (1998:16) concludes that the area of the compound was used exclusively as a cemetery, similar to a modern cemetery, but divided into ethnic, instead of religious, groups.

This suggests that the Aboriginal people buried in this cemetery were living a sedentary life because of the provision of a segregated area for burials, but that they had retained some traditional behaviour such as sitting burials. It is not certain that this was the traditional Shark Bay method of burial as there is some suggestion that extended burials were preferred (Bowdler 1998: 14) but this is not inconsistent with the cultural mixing that may have occurred in the industry due to blackbirding.

The burials also indicate that at this stage they were wearing European clothing. Wear on the upper left canine of two of the skulls is damage consistent with smoking a clay pipe (Bowdler 1998:19) and there are caries on the other teeth which are inconsistent with typical traditional Aboriginal tooth wear (Bowdler 1998:19). It would appear the Aboriginal people of the Shark Bay area who were working in the

pearling industry had adopted facets of European dress, settlement and diet by the end of the nineteenth century.

According to Jack Fry, by the 1930s there were no Aboriginal labourers working in the pearling industry (OH 2266/8), although the ethnic mixing described by Von Bamberger would have rendered any such clean cut divisions of labourers into Aboriginal, Malay or European nigh on impossible. It is possible that Mr Fry was referring to Aboriginal people who had never engaged in the industry or adopted the pearlers' lifestyle.

Treatment of the labourers is nowhere documented as rigorously as in the case of the indentured labourers. Supervision of this labour was stringent because of the Colonial Authorities' desire to

a) prevent the labourers settling,

b) prevent the labourers becoming a financial burden on the colonial economy,

c) prevent international embarrassment, with regard to the mistreatment of labourers who were citizens of countries who had trading alliances with imperial authorities.

Unfortunately this recorded scrutiny details mistreatment tantamount to battery, starvation, abandonment and insufficient provision of supplies, shelter and payment.

This embarrassed the imperial authorities to the extent that laws were enacted

a) to ensure that the labourers were the financial responsibility of the master pearlers; and,

b) that their medical and domestic needs were sufficiently provided for.

This essentially produced a tug of war between the entrepreneurs and colonial authorities, neither of whom wanted the responsibility of the care of the labour

force. Basically the master pearlers felt it was the duty of the authorities to provide them with a cheap labour force.

The 'Malays' generally earned a maximum of a third of the European wage (McGann 1988:111). Regardless of the care the authorities took over the conditions of the Asian pearlers, bankruptcy of the master pearlers resulted in stranded and resource-less workers who were then at the mercy of the other pearlers. To find alternative employment was often the only option open to them.

Eventually the Dutch authorities took the matter into their own hands and with the use of the deposit system, made the hiring of offshore labour an unattractive financial proposition. The "Malays" were viewed as 'clean' and not as troublesome as the Chinese Pearlers (OH 2266/8), probably because they worked for a monthly wage rather than on their own boats, which would have constituted competition for the European pearlers. They remained after the pearling finished although they were confined to 'one end of Denham', 'never mixing' (OH 2266/8).

Tensions between the ethnic groups were keen (Herald March 28 1874; West Australian 1 & 2 February 1888), however, and after the murder of a European woman violence erupted. The situation was so bad that in 1888 the Shark Bay Pearlers Association asked Carnarvon's Resident Magistrate to approach the Colonial Secretary's Office with the proposal that the Asians be disarmed (McGann 1988:114). Expressing their regret that they were unable to do so, the authorities declined in view of the fact that they did not have the power under martial law (McGann 1988:114). The murder case was not the only casualty, with most incidents involving alcohol and knives (Herald March 28 1974). The favoured European method of

inflicting harm was beating and shooting, while the Asians showed a marked preference for knives. Both proved fatal in a number of cases.

According to Goulder (1990:21) there were significant numbers of Chinese at the Monkey Mia camp and the CSO (5390/84) records a similar situation at Cape Leseur. Fry (OH 2266/8) says his grandfather reckoned there were 500 Chinese Pearlers at a camp at Notch Point. This would obviously pertain to the period of the industry between 1870 and 1886 after which the Chinese were excluded from the industry except in a labouring capacity.

In Denham the south of the town was inhabited by Malays (Fossa 1993 pers.comm.), the east by the Aboriginal people and the beach front property, directly behind the sheds, was the province of the pearlers of European descent. According to Von Bamberger (1980) the early pearling population consisted of European, Chinese and Malay bachelors and Aboriginal women. By the turn of the century there was a mixed population and `ranked social/ethnic divisions developed' (1980:70). Attempts were made by the authorities to prevent this mixing (McGann 1988[2]) and this segregation was mirrored in working conditions where the skippers were European and the crew were Chinese or Aboriginal (Von Bamberger 1980:72).

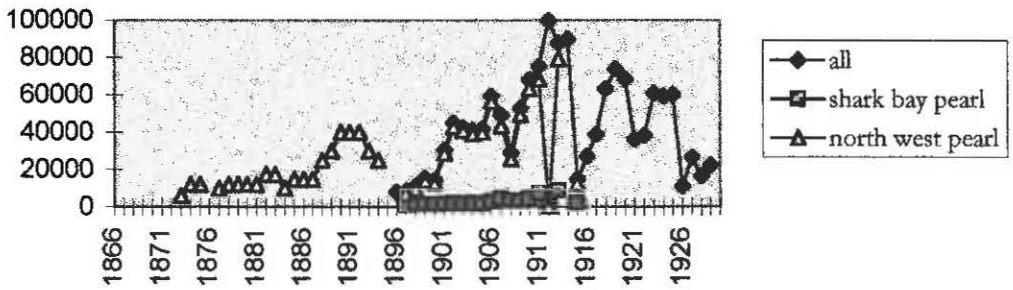
[2] No relation to present author.

Graphs one and two demonstrate that the Shark Bay returns were a negligible part of the revenue from the state pearling industry. Shark Bay shell was worth far less than the shell found on other parts of the coast, between £5 and £35 compared to approximately £150. Despite this, in the euphoria of the 1870s, it was remarked in the Inquirer that pearling

> ...as pursued here, is unquestionably more easy, and I will say more profitable than a goldfield (Inquirer 3rd December 1873).

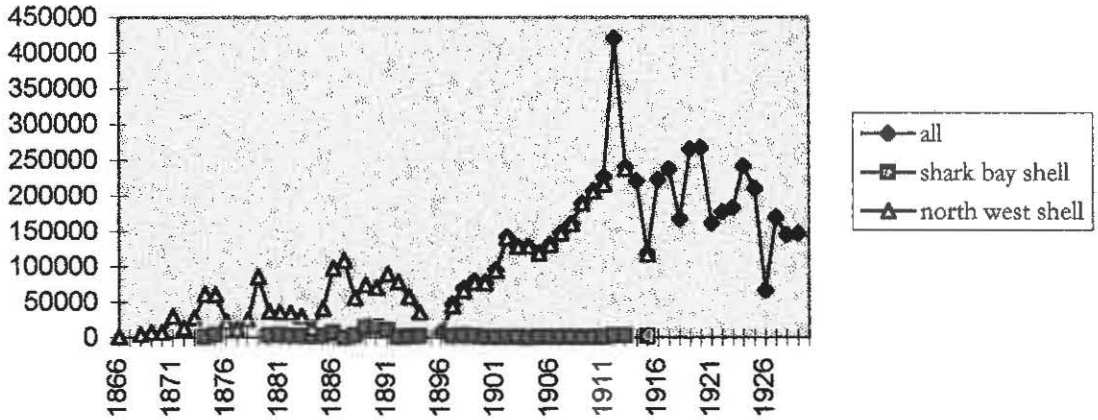
The information in the graphs was compiled from records in the Blue Books. Despite the fact that the Shark Bay shell was considered separately from the rest of the industry, the Shark Bay pearls were counted with the state pearls and must have been of comparable value. After 1897 when the pearls are listed separately the quantity is not given so it is impossible to calculate the market price. Pearls and pearl shell, as luxury and decorative items, were subject to the whims of fashion and this is reflected in the fluctuating prices achieved on the market.

Pearl Revenue



Shark Bay initially appears in the records in 1874 when the shell was taxed. Broadhurst marketed the shell for the first time in 1873. Prior to this only the pearls were sold. There is no return from the shell between 1876 and 1879. It would appear that when Broadhurst abandoned his Shark Bay interests, none of the other pearlers were prepared, or able, to market the shell. Transporting the shell to the European market would have been a huge task, beyond the means and ambitions of pearlers who were interested in quick returns.

Shell Revenue



In 1887 and 1888 the Shark Bay industry fell sharply and this is probably due to the environmental exhaustion that dogged the history of the Bay (Moore 1991) and a reduced industry due to the exclusion of the Chinese. After this there was a boom that corresponds to a rise in the value of the shell. This lasted until 1892 when environmental degradation was again a problem and the banks were closed. The pearlshell prices are consistently low from the turn of the century, comparable to the prices before 1889.

Pearl revenue was more consistent than that from the shell and Nayton (pers.comm 1993) suggests that the pearl sale figures were estimated by the authorities as it was difficult to collect this information. Although Shark Bay pearls were supposed to attract the same market value as the larger pearl the revenue from these pearls was negligible in comparison to what was obtained in the North West, which is consistent with the size of the two operations. After 1900 the revenue from the Shark Bay pearls exceeded, for the first time since 1880, that of the shell.

Shell prices experienced a meteoric rise and fall in the years 1912 to 1915 but Shark Bay was excluded from this. Pearl shell for the manufacture of general goods was obviously in more demand than that suitable for buttons only. Alternatively, if there were still a market for the Shark Bay shell this would indicate that the Bay operation was incapable of meeting the demand, possibly due to the environmental exhaustion evident in the 1890s. After 1915 all of the returns from the Western Australian pearl and shell fisheries are combined and the Shark Bay figures are lost.

As Shark Bay was not accessible to communication or transportation lines, and as it was not intended as a permanent settlement, it was peripheral to the frontier. The configuration of the bay prevented the region developing into a major port. The question here, without wishing to assume the consequences, is why was Shark Bay not accessible? This is more a function of infra-structural priorities than of geography. What was Shark Bay's place in the colonial economy? The pearlshell was a resource that attracted fortune hunters, merchants and served to feed the frontier, especially the pastoral industry, rather than form a part of it. Thus it served two purposes.

1) It fed the agrarian frontier economy by providing quick profits for pastoralists.

2) It soaked up some of the labour resident in the capital, although this is debatable because the importation of labour indicates that the pearlers were not willing to pay the wages that were standard in the capital.

As an example of someone who invested heavily in what was an industry typified by its need for little capital, Charles Broadhurst was the biggest. He also fell heavily. His substantial campsite at Wilyah Miah and investments in elaborate equipment were insupportable in an industry characterised by little need for technological or financial support. His camp at Wilyah Miah was not unusual in terms of structure but in later descriptions of other camps, wooden structures were apparently limited to those that could afford them and not provided for labourers. Bachelor labourers, in particular, are portrayed as being content to live in communal tents rather than wood and zinc huts. Broadhurst's behaviour in providing houses for his indentured labourers seems a little extravagant in comparison to the rest of the industry.

The pearls were sold through a buyer who came every three to four months on the steamer (OH 2366/13). Other accounts suggest that the general store dealt in pearls at some stage (OH 1688). Some of these pearls were destined to be crushed for face powder in France (OH 2366/13). The pearls were sold through Dalgety's in Perth (OH 2261/16). They were divided according to the following categories.

◊ Grade One Pearls - were perfect and destined for jewellery manufacture.

◊ Grade Two Pearls - 'barrick' (baroque?), or asymmetrically shaped, and were sold for face powders (OH 2361/16).

The occurrence of the pearls, despite their assymmetical shape and darker colour, was numerous enough to make their extraction and sale economically viable. Unfortunately they were still at the mercy of fluctuations in the market because fashions in jewellery, and even cosmetics, have a tendency to instability.

RESEARCH FRAMEWORK

In this section I consider relevant issues that are not strictly historical. As historical archaeology is the study of cultures with written history it has necessarily devoted a large portion of its energy to the study of colonialism and capitalism, especially outside the Old World. Colonialism and capitalism are studied in terms of ethnic cohesion and division, social structures, distribution of resources, and the imposition of ideologies and trade. Consequently this field of study should be one of the most exciting in the discipline.

The most relevant field of study to this project to emerge in historical studies of the material record is that of industrial archaeology (Hardesty 1985), specifically industrial frontiers. The archaeological record of extractive industries in Australia is unlike that of the settlements based on family owned, inheritable, geographically definable and stable farming economies. Extractive industries are lucrative, attractive to the individual and often short lived.

Lewis (1977:153) defines the frontier as

> ...the area in which the outer edge of an expanding society adapts to the conditions of attenuated contact with the homeland and the physical conditions of a new environment.

In America this took the form of a westward migration of surplus labour and adventurous spirits. This meant that there was a continuous sequence of frontier and settlement repeating itself as the colony expanded. In Australia, however, the spread of settlers across the continent was impossible because of the climatic extremes encountered inland. Instead, colonisation was limited to the coastal plain on the southern, western and eastern coastline. Limited expansion occurred inland and northward but generally the

> ...concentration of manufacturing industry in coastal cities gave to Australia its distinctive concentration of industrial and political power in capital cities of the eastern and southern seaboard which were also large industrial centres (Alexander 1947:34).

Added to this is the distinctive nature of fisheries which are, by definition, limited to the coast and allowing little movement west or east (Alexander 1947:6). Movement between fishing areas as shellfish stocks became depleted rendered the pearlers mobile but not progressive in the sense of the frontier/settlement sequence. The pearl fisheries remained on the periphery of the centralised, industrialised Australian state system with little evolution of the infrastructure of the towns or camps themselves and little interference from colonial authorities.

Lewis (1977:159) outlines four broad topics for the investigation of frontier settlements. These are as follows.

> 1) ...the beginning and termination dates of the settlement's occupation.

2) The ethnic or cultural affiliation of the site's inhabitants as evidenced by their ties with the society of the metropolitan area.

3) The form and spatial extent of the past human occupations of the site.

4) The nature of intrasite variability and the distribution of behaviourally significant archaeological materials.

As can be seen in Chapter One, the aims of this current study were based broadly on these themes although the 'distribution of behaviorally significant archaeological materials' is used here as a means to elucidate the other aims rather than an end in itself. Furthermore the beginning and termination dates of the industry are readily available in the historical sources.

THE FRONTIER AND THE MATERIAL RECORD

Hardesty (1985) states that extractive industries are characterised by their temporary nature and reliance on the homeland. These frontiers he terms *cosmopolitan* in comparison to the *insular* nature of the agrarian frontiers. Insular frontiers are characterised by their diverse nature determined by the isolated, permanent and self-sufficient constitution of the settlements. Cosmopolitan frontiers on the other hand were widespread, short term, specialised, and dependent on national events, supplies and developments (Hardesty 1985:213).

This is certainly true of the era of the master pearlers, but the smaller groups consisting of one pearler, labourers and boat that later settled in the Bay obviously

had longer term hopes for the industry. After the initial euphoric rush of the 1870s the industry stabilised to a certain extent. After the 1890s it began to degenerate because of environmental exhaustion; those who had intended to make their fortune quickly left. The remaining pearlers were those who had married and settled in the bay and did not relocate. The archaeological record should demonstrate some change at this stage to indicate that the bay was now settled rather than 'camped' and 'exploited'.

This compares well to Lawrence's (1995) "poor man's diggings" where

> Through the latter half of the nineteenth century numerous low grade ore deposits were worked by self employed miners throughout Australia (Lawrence 1995:59).

In Shark Bay one has the opportunity to examine the transition from fully exploitative industry to 'poor man's diggings'. The distinction between Lawrence's 'poor man's diggings' and the Shark Bay pearling experience is that at Shark Bay the population had developed into a relatively permanent settlement. In terms of survival the Bay could no longer support larger concerns and only small family groups with low labour costs could remain in the area. Equally, only the larger players, with more capital behind them could afford to leave Shark Bay. Others, who had interests in Shark Bay which were controlled by managers or from Perth or various stations, simply withdrew their capital.

According to Lawrence (1995), the demography of such diggings was characterised by large numbers of men of working age, and significant numbers of young children

and married women (Lawrence 1995:62). Based on this, and observations of modern mining towns, presence of the aged and of single females of marriageable age is an indicator of a settled community and the presence of wives and children are not. With respect to the aged, this is due to the inability of older people to work and the need for health care facilities that are unlikely to be provided at an outpost. A more mature town based on families with people who may have in fact aged in the Bay would be different; such a community would be obliged to care for its elderly.

Female children who had grown to maturity in the Bay would be treated differently to single females from outside the area. A second generation of pearlers would have provided the opportunity for intermarriage between the settlers and the strengthening of the small community. The sisters of pearlers were quite often introduced and married to other pearlers but generally single females from outside the region would have no economic place on the frontier as wives and children, and not women alone, provided the shore labour. Women were not *employed* as labourers.

Young (1998) describes the genteel aspirations of nineteenth century women. The removal of paid labour from the domestic sphere in this period created the idea of "private, domestic, leisured women" and the "professionalism of household management into domestic economy" (Young 1998:134). Industrialisation also ensured that the changed status of women should be visible in the material record.

> Mass production of domestic goods such as iron cooking wares, ceramic table goods, printed cottons for furnishing and clothing, and small metalwares such

> as cutlery and jewellery,...had a new and specific market among women for the first time (Young 1998:134)

As we know that the women in Shark Bay were not 'leisured' and the industrial work economy was not removed from the domestic sphere, the genteel aspirations of the nineteenth century women should have been somewhat limited in nineteenth century Shark Bay. However, the mind set of "self improvement" among the displaced, socially mobile, immigrant masses in Western Australia last century was probably one of conspicuous consumerism and "genteel characteristics" (Young 1998:135) independent of any solid moral or financial foundation.

Yentsch (1991) and Young (1998) both divide the domestic sphere by gender. According to Yentsch, the back of the house is the female arena because of the limited access, visibility and orientation (Yentsch 1991:258). The kitchen and laundry areas are usually placed to the rear of the building while the public, or male, activities are at the front of the house. Young, however, reverses this model for the same reasons.

> ...where a few fine ceramics were located at the front of the house and plenty of gin bottles and oyster shells in the backyard, which can certainly be interpreted as the presence of a woman maintaining aspirant standards in the parlour while uncouth masculine behaviour is banished to the backyard. (Young 1998:137)

So it is the division of domestic goods rather than their distribution or presence that indicates the occupation of women and "the drive to genteel living" (Young 1998:137).

Family occupation does not necessarily involve substantial structures. Lawrence (1995) states that

> ...occupations on mining sites were short-term but the site and the dwellings could be used and reused many times over the years. It was customary for people to leave one diggings on hearing of discoveries elsewhere only to return when those discoveries were worked out (Lawrence 1995:60).

This is certainly true of Shark Bay where pursuing the banks, which were occasionally closed by the authorities for environmental reasons, and, after 1892, abandoning exhausted leases, were necessities. So a network of individuals operated at a range of extractive areas within Shark Bay.

Initially the distance from the market and the transitory nature of the operations created a kind of camp autonomy. As the pearling economy was entirely dependent on supplies there was no pooling of resources and no specialisation of craft for infrastructure.

> According to McGowan, pubs and stores, amongst the first businesses on new diggings, reflect the private, entrepreneurial spirit associated with rushes while a broader community and the development of public institutions suggests the emergence of a shared community identity (Lawrence 1995:63).

I contend that outside supplies created subsistence autonomy between the camps within Shark Bay. When there was a permanent population present with less financial resources the sharing of infrastructure and the provision of commercial services would have necessarily been local and central. This may be visible in the assemblage and settlement patterns or merely in the dispersal of camps documented in the Police Occurrence records in the archives.

FRONTIER IMPLICATIONS AND THE ARCHAEOLOGICAL RECORD.

The relevance of the above framework to the excavated material analyses in this study is that the early camp autonomy would have created a generalised, homogenous culture dependent on the 'homeland' for standards as in Hardesty's (1985) cosmopolitan frontier. Later developments and independence from the capital of Perth may have created a Bay autonomy that allowed the growth of a new identity and material culture. Conversely this may have made the local ideology and material culture more conservative. Examination of the archaeological record will need to take this into consideration.

It is expected that the transition from cosmopolitan frontier to settled community should be visible in the record. Based on the assumption that the intention of permanence has an impact on the behaviour of colonists, I contend that the archaeological deposit would record the change from sojourner to settler. It was expected that this would manifest itself in a shift over time to greater preservation of the resources of the bay, more interest in and knowledge of the resources of the bay and the improvement of infrastructure and facilities. It is expected that the services

would evolve from provisions and liquor stores, to medical centres, schools and churches.

The visibility of women and children in the archaeological record should be enhanced by the nineteenth century division of labour between the public, or male sector, and the private, or female sector. Although this division did not exist in Shark Bay the division of these activities in the homeland had been strengthened by the division of consumer items into domestic and public to such an extent that even in the same arena they psychologically constituted separate spheres. Therefore the change in proportion of typically male items and female items should indicate an increase or decrease in the presence of women.

ETHNICITY AND SOCIAL STRUCTURE

After 1886 the Shark Bay class system appears consistent with Orser's category of a "... racial and legal entity without a financial determinant ..."(Orser 1995:216). That is, income was determined by class rather than the revenue dictating the class. Non-European groups, particularly the 'half castes', were excluded from positions of influence (Von Bamberger 1980). Initially the Shark Bay society was organised into two classes; the upper or master pearler class included only European pearlers. Asian pearlers tried to subvert this through the process of dummying. Dummying involved persuading, usually by paying, a European pearler to put his name on the application for a pearling lease which the Asian pearlers would then work (Atkinson 1981). Before the 1890s, however, the bachelor labourers included predominantly Asian

men. After this time the operation was organised into family groups. Pearlers operated small groups with family labour and small numbers of labourers.

Asian men were not allowed to settle or bring family to Australia or, after 1886, invest in the industry, and therefore they merely constituted part of the labour force. It was never the intention of the colonial authorities that the Asian labourers and pearlers should form a permanent part of the population. This much is evident in the legislation. For their part it is probable that the Asian pearlers did not regard Australia as a permanent home either. Their intention was to make their fortune and return to their homes in China and South East Asia (Hardesty 1985:222).

Orser (1995:218) claims that as ethnic groups become socially mobile they tend to dispense with ethnic material culture and adopt the colonial culture. Ethnic markers in the case of the indentured labourers are indicators of identity in resistance to control, or the preservation of the culture of the homeland during what is considered to be an impermanent absence. The idea of permanence effects the idea of identity. When travelling, people are prepared to maintain the culture that they are intending to return to. The decision to remain in an area and adopt it as home decreases the need to maintain the cultural standards of the homeland. Proportionally, then, when the traveller becomes the settler, the change from conservative material culture to innovative material culture should become apparent.

Conversely, as a person gained financial strength their ability to acquire foreign items would proportionately increase. Spier (1958) has studied the conditions under which the Chinese sojourners used Western tools in nineteenth century California and

concludes that occidental tools were readily adopted only if the employers furnished the tools and if the "...occupation of the Chinese was one for which there probably was no precedent in their experience" (Spier 1958:111). Traditional tools, however, were found to have been used whenever possible (Spier 1958:111).This suggested that ethnic minorities would become more archaeologically visible as they settled, acquired financial investments in the industry and were able to import paraphernalia. Consequently investment of immigrant capital would be evident in the tangible record.

SOCIAL STRUCTURE AND IMPLICATIONS FOR THE ARCHAEOLOGICAL RECORD.

The presence of the Chinese in Shark Bay is undeniable and was closely scrutinised by the local authorities. The corresponding assemblages may reveal the degree to which ethnicity affected the material culture or whether a generalised "industrial culture" can be inferred. It would be an opportunity to observe the impact of non European people on the colonial/industrial material record and to test the following, possibly mutually exclusive, propositions.

1) Permanent settlers dispense with the material culture of the homeland,

2) Only those in a position to import goods would be visible as a distinct ethnic group in the material record.

Obviously permanent settlers, rather than labourers, would be in a position to import goods, but then would they still want to? The confirmation of this would be dependent on the discovery of deposits containing exotic material with tight

chronological control to distinguish between permanent and impermanent periods in the industry.

The indigenous labour force also formed an ethnic minority. To look for ethnic markers indicating Aboriginal presence would require the excavation of sites distinct from the middens. Historical Aboriginal artefacts, that is, those made of European materials, were found only on the surface *adjacent* to the pearling camps. This evidence of spatial distinction demonstrates the ethnic barriers but to excavate these sites is beyond the scope of this study. Reynolds contends that

> Sea based industries were probably less disruptive of Aboriginal life than either mining or pastoralism (Reynolds 1990:175)

because the pearlers had little need to acquire large tracts of land (Reynolds 1990:175).

Because of the pastoral industry, however, the local Aboriginal terrestrial economy would have been severely disrupted. Therefore Aboriginal contributions to the subsistence economy of the pearlers would have been marine only. It is argued here that as Denham later became an important commercial fishing center, some sort of adaptation to the marine resources other than pearlshell had taken place but not until a settled population had developed.

The archaeological visibility of the local Aboriginal people, therefore, would be confined to the adjacent fringe camps or the evidence of distinctive resource use. It is contended that this would manifest itself in the use of traditional Aboriginal

resources by the European pearlers. It is obvious that Europeans were quite happy to use information pertinent to pearling.

The archaeological invisibility of the Aboriginal people in the European record other than the assumed contribution of information pertinent to the pearling industry could suggest the ideology of impermanence held by the pearlers. That is, it is assumed that the neglect by the pearlers of local resources would demonstrate a transient attitude to settlement in the Bay.

RESEARCH STRATEGY

Wilyah Miah is a Mulgana term meaning "shell place" (Winder 1993:pers.comm.) and it is also the name of the major pearling bank in the Shark Bay region. The name was chosen as the title for this study as it illustrates the Aboriginal involvement in the industry. This is a study of the bay industry in total and the title is not intended to celebrate the importance of one site only.

In 1992, under the direction of Professor Bowdler, The Old Pearler site was excavated as part of the Shark Bay project. This material was subsequently offered as a Master's project. In 1994 I conducted a survey in the bay to establish what remained of the pearling camps and to map the distribution of the camps. As a result of this, a second site, Gavin's Site, was excavated and recorded in 1996.

The 1994 survey was conducted using maps of known pearling areas derived from WA Department of Fisheries records and oral histories. Sections of beach in the vicinity of these areas were surveyed on foot by myself and volunteers covering all levels of the beach. Pearling refuse was noted and marked on 1:250 000 maps. In some cases concentrations of artefacts were sampled and their location recorded. This material was bagged in the field and taken to the laboratory for analysis. Most of the coastline, excepting those rugged areas deemed completely unsuitable for pearling activity (see model below), was surveyed and recorded.

SITE ANALYSIS

The aims of the site analysis were to gauge the changes in dispersal of the camps over the area of the bay to see whether this was effected by access to open banks, capital investment or the location of the domestic unit. Secondly the constitution of the camps with regard to ethnic affiliation was drawn from historical references describing the position of the groups. Then patterns of preferential positioning of different ethnic camps with regard to access to resources, the beach, the banks and each other were sketched.

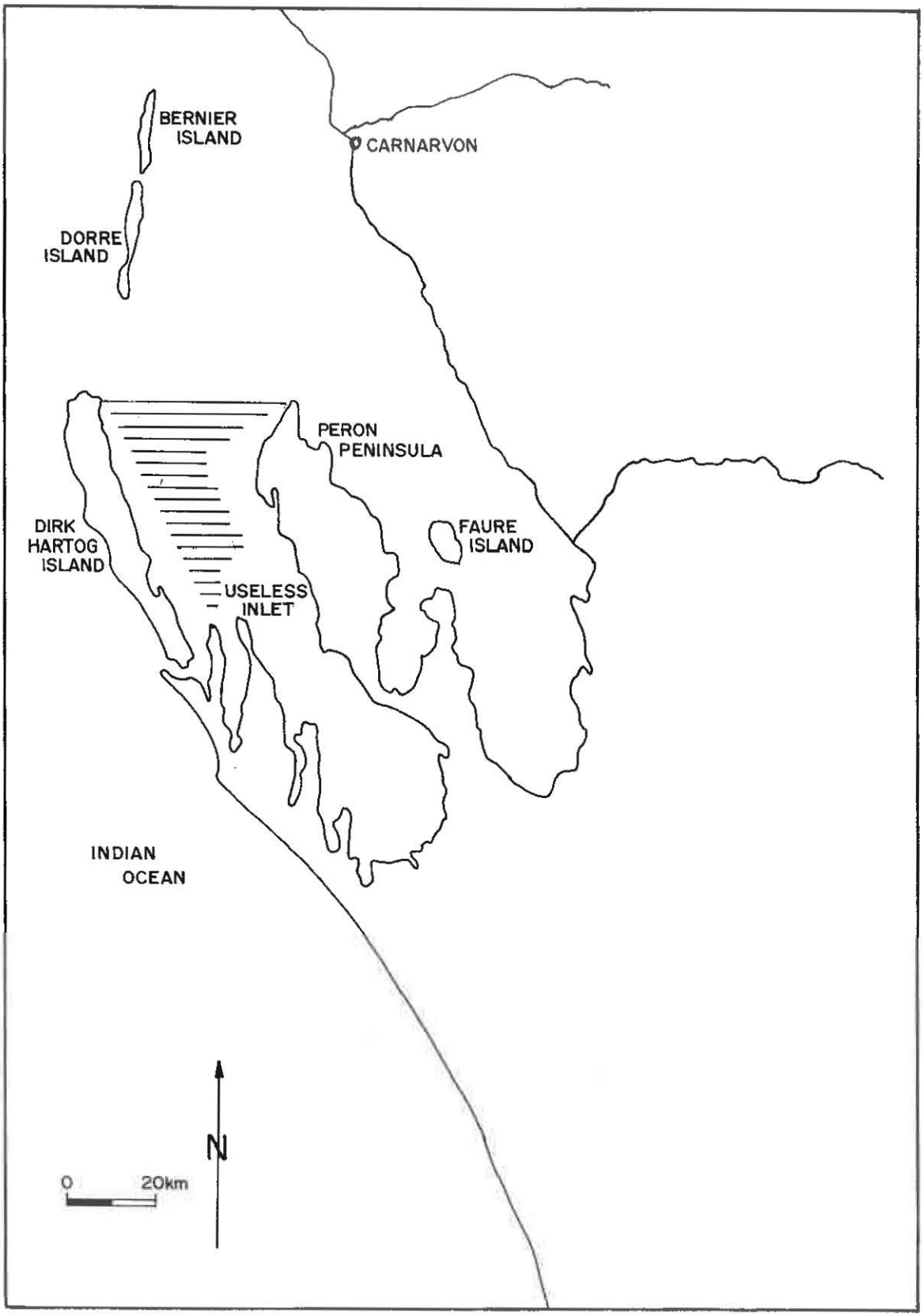
Atkinson's (1981) thesis Chinese Labour and Capital in Western Australia and McCarthy's (1989) thesis Charles Edward Broadhurst (1826-1905) were relevant to the Shark Bay pearling industry. Anne Atkinson and Mike McCarthy made available archival notes collected during their respective PhD and Masters of Arts courses. Prior to the 1994 survey historical records were consulted as follows. The Colonial Secretary Office (CSO) records and the Department of Aborigines and Fisheries files, which replaced part of the CSO after federation, were scrutinised at the Battye Library. Biographical indices, The *Inquirer*, *The West Australian*, previously transcribed oral histories, management reports and secondary sources were inspected for relevant information.

A trip to Shark Bay in 1993 facilitated the collection of several useful oral histories and maps, and an ABC radio program attracted valuable attention and resources. The collection of these sources post-dates the Old Pearler excavation and it was thought

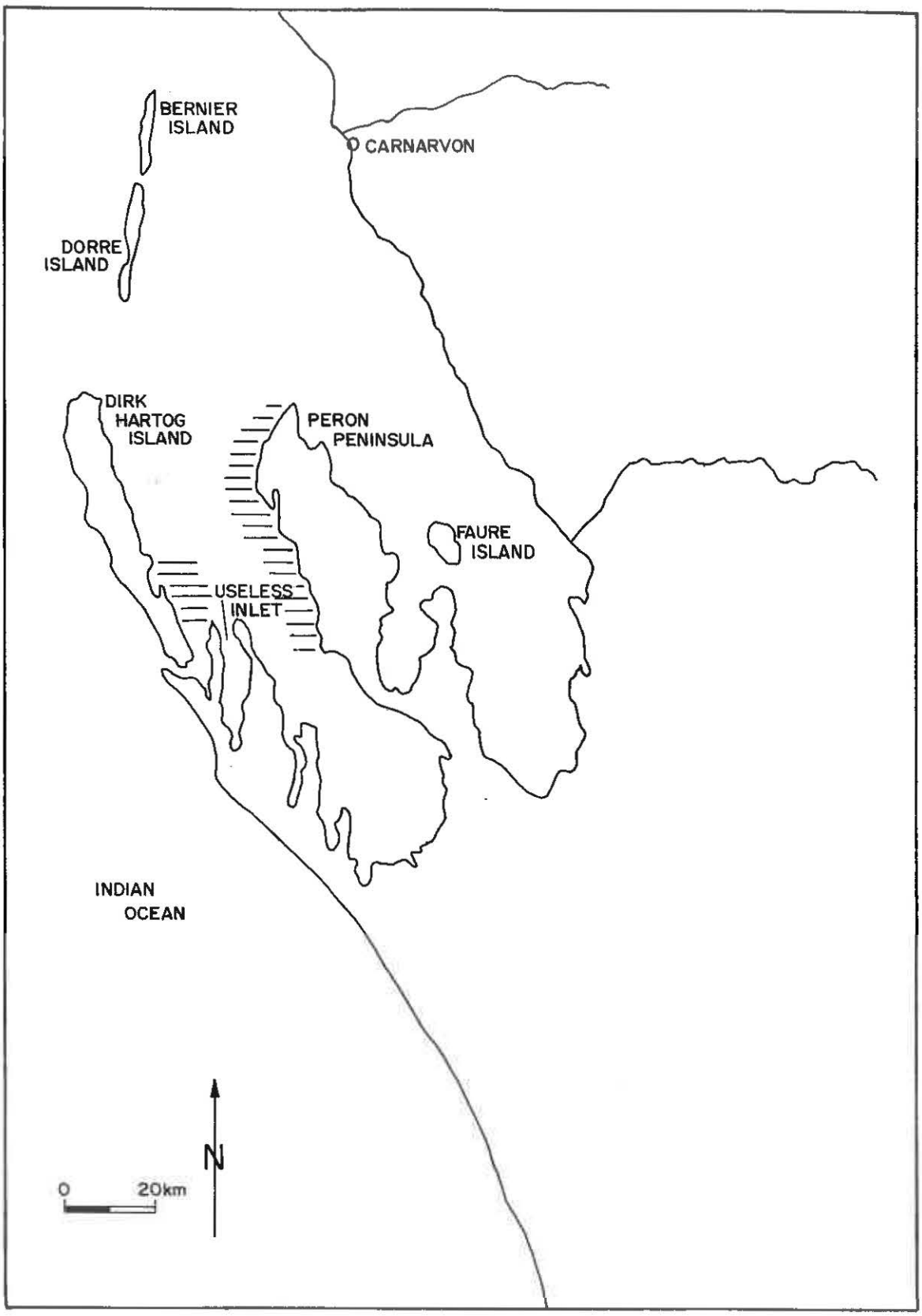
useful for a complementary site to be investigated. Gavin's Site was thought to be a younger site than The Old Pearler, relevant to the putative third phase of pearl and pearlshell extraction (see model below).

No detailed records of structures were apparent but a map outlining the pearling leases was provided to the Western Australian Maritime Museum by the Hoult family of Shark Bay. A rough map of pearling camps in Useless Inlet was also provided to the Maritime Museum. The map of the pearling leases is no indication of the situation of pearling camps but gives a general idea of which leases may have been in use at any given time. Descriptions in the archives are a more useful indicator of the chronological sequence of camp occupation (see appendix one) but to allow for the possibility of chronological change in the spatial relationship between camping and pearling areas a separate map of the fluctuations in bank exploitation has been included to compare the sequences (see figures two and three). This, combined with the map of the leases marked after the advent of individual pearling plots (see appendix), gives some idea of the fluctuation in pearl bank use.

Although the banks and camps were not used on a permanent basis, it is reasonable to assume some relationship between camp location and banks. It is also suspected that the proximity of camps to banks varied over time. That is to say, camps may have become more centralised or more dispersed as leases changed from group holdings, or master pearler camps, to small domestic units. It is contended that travelling distance to the banks is a less important factor in the placement of camps than labour structure. Obviously convenient distances to the banks would have been preferred.



1880 - Closure of the Pearl Banks



1884 - Closure of the Pearl Banks

For example if the Dirk Hartog banks were in use, then Peron Peninsula is more than likely to have been abandoned. However, as boat technology and therefore travelling time did not change greatly over the Shark Bay pearling era, it is not expected that any major changes in the relationship between banks and camps could be linked to changes in travelling efficiency.

The spatial interpretation of the industry in Shark Bay includes charting the movements of the pearlers as they were motivated by the provision of infrastructure and environmental deterioration. Archival searches and the survey were essential to illustrate the distribution of sites but the question of dates has so far been difficult to resolve in the field. Archaeological confirmation of the historic records requires further survey and collection.

The 1994 survey confirmed the presence of some known camps, failed to find the others and discovered some new material. Some areas, which failed to yield pearlshell midden, were obviously unsuitable for pearling camps and always would have been, but it is posited here that others contain sites that are now hidden beneath mobile dunes. This was confirmed to a certain extent by local residents who have observed topographical changes, but to test pit every potential area or to wait for provident exposure was beyond the scope of this project.

MIDDEN STRUCTURE

A midden in the Australian archaeological definition is a deposit containing "...50% by weight or more of a class of faunal remains: the shells of marine or freshwater

molluscs" (Bowdler 1983:135), the remains being kitchen refuse. Unfortunately the problem for archaeology is that animals, chiefly birds, and the environment itself can create mounds of shell. Birds drop molluscs on rocks to break them open, creating middens of shell that have been opened and the animal inside consumed, mimicking the human version. Catastrophic events such as storms can also lift large amounts of shell onto the beach creating mounds. The shell in these mounds, however, contains the entire range of shell present in the surrounding environment while human and bird middens are selective of species and size of shell. The criteria used to distinguish between human and 'other' shell mounds are as follows.

1) Middens contain charcoal, burnt wood, blackened shells, artefacts and hearth stones.

2) Middens are unstratified or roughly stratified; shell beds are generally well stratified and show sedimentary features of water laid deposits.

3) Middens contain shells of edible species and sizes.

4) Middens do not contain shell worn due to transport in the offshore or beach zone.

5) Middens contain the bones of mammals used for food.

6) Middens do not contain forms of marine life not used by Aborigines, such as corals and tube worms (Hughes and Sullivan 1974 quoted in Bowdler 1983).

These criteria were developed for the consideration of Aboriginal middens. It can be seen from the archaeological remains at Shark Bay that the industrial midden does not conform to this pattern. The middens in this case contain shells of various

species and sizes, water rolled shell, and forms of marine life that are not used by humans. In this way they could be confused with mounds resulting from a catastrophic environmental event. The middens are, however, unstratified and they do contain bones of mammals and birds used for food, and charcoal and artefacts. The predominance of pearlshell is also a clue to their origin.

There is reason to believe that the industry and the middens changed over time. Middens comprise the major portion of historical pearling material in the Bay. The middens consist of pearling refuse and artefacts, and with reference to the history of the industry I predicted that there could be a three phase sequence based on the composition of the middens. McCarthy (1989) discusses the progression from `dry shelling', or collecting shell at low tide, to `wading', to actual diving for shell in the North West. In Shark Bay there may have been a progression from dry shelling to dredging when Cadell introduced dredges in 1870. These two methods would correspond to the differing assemblages of shell. Dry shelling would be more discriminating than dredging which would return a wide variety of shell and possibly even fish.

At Shark Bay the dredging proved environmentally detrimental or rather too economically draining. Because the shell grows on the sandy bed the young attach to the mother and are subsequently dredged with the larger shell. This is not economically viable and in 1892 restrictions were put on the leases which meant that smaller shell had to be returned to the water. I predict that this also would have resulted in a midden of pure pearlshell. Sorting of the shell in the boats would have provided more space on the boats for pearlshell of regulation size.

My proposed sequence of the middens is as follows.

Collecting phase - consisting of the pure pearlshell resulting from hand collection of shell which is obviously a quite selective method. As this method is not highly productive and does not therefore correspond to an intense period in the industry, it is posited that remains would be minimal.

Dredging phase - consisting of dredging waste, which is an indiscriminate mess of shell species and sizes. Contradicting everything that is assumed to characterise humanly deposited middens of shell, these mounds would appear to derive from some natural catastrophic incident were it not for the presence of indisputably human artefacts and the discrete nature of the middens. Shell sizes are also varied. This activity corresponds to the most prosperous, active and populous period of the industry and is thus proposed to be the largest and most visible part of the industry.

Monitored phase - government intervention designed to prevent environmental degradation should have affected the middens dramatically. It is proposed that the middens corresponding to this period be composed of pure pearlshell of a regular size and an unmarketable quality. They should also be arranged in smaller more discrete camps conforming to the smaller domestic units that comprised the industry at this stage.

The placement of the middens has changed little over time. From the observed features of areas with pearling refuse it is concluded that the pearlers preferred flat sandy beaches with access to the pearl shell banks. The geographical relief of Shark Bay is such that these beaches can easily be divided by topographical features and

tend to be discretely demarcated by obvious points and dunes. In the late phase of the industry this helped divide the bay into small leases but in the earlier era larger camps centred on long beaches and points such as at Monkey Miah, Herald Bight, Wilyah Miah and Cape Leseur.

Typically camps were not located on the rocky capes which are open to environmental extremes and those on very open beaches are concentrated near points or behind small peninsulas. Similarly cliffy areas were completely unsuitable for landing the shell and camping in close proximity to the water. Furthermore they were not located at the southern end of Shark Bay because the extreme salinity here was unsuitable for pearl shell propagation.

ARTEFACT ANALYSIS

The first of the two industrial questions is, quite simply, what was the nature of the earliest pearling in Shark Bay? There is little historical documentation on the activities of the pearlers between 1850 and 1870 due to the fact that the revenue from the pearls was not then taxed. Therefore it was considered useful to try to find the oldest pearling site that is in existence in the Bay.

> Environmental adaptation is a major theme for the historical archaeologist to investigate even after the early stage of settlement (Birmingham 1983:9).

The Old Pearler pearling midden was excavated in 1991. An analysis of the material from the Old Pearler, the material from Gavin's Site, and superficial inspections at

the other pearling sites indicate that the midden content of all of the sites, despite assumed temporal differences between the sites, are identical. Analysis of the middens with regard to pearlshell content and the ratio of economic to non-economic shell was carried out to test this proposition.

Based on the assumption that dredging waste is an indiscriminate means of procuring pearlshell and the other methods are not, midden material was divided into economic and non-economic marine remains in order to distinguish the two types of midden. Dredging waste will obviously have a significantly higher proportion of non-economic marine material. The non-economic category in this study includes all marine material considered to have no domestic *or* industrial value.

Species other than pearlshell have been analysed to investigate the possibility that the mixed nature of the midden is the result of the contribution of kitchen refuse. The assumption is that the presence of large amounts of very small shell, or shell deemed economically invalid, would indicate that the material results from indiscriminate industrial practice rather than domestic contributions. The ratio of economic and non-economic shell was compared between sites. The amount of domestic artefacts in each midden was also compared.

Non-economic and economic shell are distinguished on the basis of size only. Other factors such as articulation or fused shells or the presence of submarine parasites on the surface of the shell itself, could have been used had the material been sorted in situ, before the disarticulation of some of the remains happened due to transportation and field assistant stress. However, articulated bivalves were not

limited to the smaller end of the size scale. The majority are large, indicating that even potentially edible bivalves were rejected. This is more evidence that the shells in the middens result from the industrial waste and not from the domestic sphere at the camps.

Of course with the non-economic category we must allow for the possibility that some of the smaller shell and the non-economic species were retrieved merely because they were attached to the pearlshell. While the non-economic category is characterised by the unintentional nature of its retrieval, it is proposed that material could be returned to the water with little difficulty as the small pearlshell was legally supposed to be.

The non-economic category includes coral, worm shells and small bivalves and gastropods. Only bivalves and gastropods were included in the counts because the other materials could not be divided into discontinuous units. *Turbo, Amusium, Codakia, Tridachna, Fragum, Callista, Circe, Chiton,* and worm shells were among the marine material.

Bivalves were separated into economic and non-economic classes using a purely arbitrary size threshold of 15mm by 10mm. This threshold is not meant to represent any meaningful dietary distinction. Rather the two classes were designed to create a discontinuity in the midden material *within* the spits in order to compare the qualities of the shell assemblage *between* cultural units.

Pearlshell was easy to discern in the midden material regardless of the size of the fragment because of the distinctive appearance of the nacre. Only those whole pearl

shells which measured less than 10mm x 10mm were excluded from the counts. All shell and fragments were included in the pearlshell weights however. The pearlshell was counted according to the Minimum Number of Individuals(MNIs). Pieces were ascribed to left or right valve only and no concession was made to size or condition of the individual shells. Only those shells or fragments with the hinge plate present were included in the shell counts but all were included in the weights.

Other bivalves and gastropods M.N.I.s were only counted in terms of unit with no reference to species, size, valve or condition. Only those shells with the hinge plate, in the case of the bivalves, or the apex, in the gastropods, present, were included in the counts. Size was only taken into account when distinguishing between the economic and non-economic shell. There was an exception to this system however. Oyster shell, because it is culturally a familiar food source, was quantified according to the system applied to the pearlshell. The numbers, which excluded the small shell, were added to the bivalve counts. These numbers were based on MNIs. The small oyster shell was included in the weights of oyster but were not included in the non-economic counts.

The non-diagnostic category included all material that was corroded beyond species recognition or that possessed so little rim as to make the estimation of size impossible. This category was weighed only.

South (1977) divides 'garbage' discard on historic sites into two areas, the adjacent and the secondary, or peripheral, discard areas (South 1977:47). The two areas are

distinguished by the ratio of bone to the total artefact count (South 1977:47). Adjacent artefact disposal is characterised by an absence of bone. South describes this in terms of an "odorimetric scale" (South 1977:179) whereby bone, which is offensive if left to rot in close proximity to living areas, is cast further from domestic structures. In the pearling camps, however, the middens were, by all accounts, odorous to the point that bone would be indistinguishable to the nose if deposited on the middens. Pearlers lived in close proximity to their equipment plants and middens and thus the boundary between adjacent and peripheral "garbage" is blurred. It can be argued that the Brunswick pattern of refuse disposal (South 1977:47) does not apply to the pearling camps, even those involving substantial structures. The middens were therefore assumed to be the primary depositories for domestic artefactual refuse as well as the shell assemblage.

Artefacts were grouped according to the Stanley South's Carolina artefact analysis of material culture (South 1977). South's methodology was used both as an analytical springboard and as a comparison. While geography is obviously a great variable in this comparison, South's work on the American frontier was considered the work most pertinent to nineteenth century Western Australian settlement. Having said that it was used as an analytical tool in order to establish a Western Australian pattern. It was found to be more insightful with regard to the local deviation from the American example than in any descriptive sense.

The assumption underlying this strategy is that patterned cultural behaviour is reflected in the artefact assemblage.

> If there are cultural processes whereby behavioral patterns are stamped on participants in a British Colonial way of life, would the by-products from such behavior also be seen to be patterned in a predictable manner? (South 1977:84).

South's (1977) framework is particularly useful as a starting point when analysing the Shark Bay historic midden refuse as structural evidence is severely limited. After the demise of the pearling era, the local inhabitants of Shark Bay, the ex-pearlers themselves, removed all reusable building materials from the pearl camps. Assuming South's patterns as a basis, allows us, we are assured, to infer activities from sites without structural evidence.

As one of the aims of this study is to demonstrate the chronological change in the industry in terms of socio-economic units, it was necessary to document the changes evident when the industry changed from an economy controlled by master pearlers and associations to one arranged in domestic units. It was contended that this would manifest itself in the change from Hardesty's (1995) cosmopolitan frontier to one more like his insular frontier. As such the assemblages should change from collections dominated by architectural and technological artefacts, to assemblages with a higher proportion of domestic remains. This indicated that the non-marine artefactual material contained in the middens should be divided into the categories outlined by South (1977) with a few modifications.

According to South the two categories that are most sensitive to frontier change while remaining insensitive to the specifics of place function are the architectural versus domestic categories (South 1977:121). The change in proportion of these

categories is assumed to indicate a move closer to the homeland or the frontier. Architectural remains dominate the frontier settlements while settlements closer to the homeland have access to larger amounts of domestic ware (South 1977:146).

Hardesty's theory explains the changing proportions of these categories in terms of differing frontiers. According to Hardesty the frontier is characterised by two different types of settlement. Insular frontiers are diverse, self sufficient and isolated (Hardesty 1985:213) while cosmopolitan frontiers are widespread, short term, specialised, and dependent on and committed to national events rather than local development (Hardesty 1985:213). These types correspond to the agrarian and industrial frontiers respectively.

Agrarian frontiers are insular because they are determined to be long term settlements that require a commitment to self-sufficiency. Industrial frontiers, such as the pearling industry, are cosmopolitan because, as they are short term extractive operations, they maintain more cultural affiliations with the homeland. They are not intended to be permanent settlements, do not regard the frontier as home, and are thus dependent on the homeland for supplies and cultural directions. These cosmopolitan frontiers are thus standardised but reduced versions of the homeland culture (Hardesty 1985:214).

Hardesty's (1985) insular and cosmopolitan frontiers should, in theory, correspond to South's domestic and architectural artefactual assemblages in proportion. It is contended that the Shark Bay Industry changed over time from a cosmopolitan

frontier to an insular frontier without ever developing into part of the homeland. The categories outlined by South (1977) should illustrate this change over time.

> ...a decrease in kitchen group artifacts in relation to architecture group artifacts resulting from the remoteness of the frontier from the source of supply (South1977:147).

Remoteness is not necessarily geographical. It can also be measured in terms of access to the homeland. After the master pearlers left, their access to supplies from Perth was also withdrawn and the settlement of Shark Bay became more self sufficient and insular. This should manifest itself in the archaeological record in terms of a change in the proportion of the architectural and kitchen artefacts, in favour of the kitchen artefacts.

CLASS NAME
KITCHEN GROUP
BONE GROUP
ARCHITECTURAL
FURNITURE
ARMS GROUP
CLOTHING GROUP
PERSONAL GROUP
TOBACCO PIPE
ACTIVITIES GROUP

TABLE THREE: Artefact Classes (Taken from South 1977:95-6).

While the detail of the categories does not closely resemble the material found in the Shark Bay middens, the broader classes were used on the material with some success. The classes were simplified however and changed marginally to accommodate the unique nature of the pearling midden. As in Orser (1988), the bone group and the ethno-botanical group were subsumed under the kitchen category (Gibbs 1995). An

'industrial group' was added to cover all artefacts pertaining to the pearling activity such as boat fixtures and dredging baskets. An 'alcohol' category was created to assess the truth behind the legends associated with pearling, namely those figuring a drunken lawless society. A 'modified' category was added to include those historic objects such as the bottle bases and ceramic fragments, which were modified by Aboriginal people to create tools.

It was also considered useful to divide South's categories, according to Yentsch's suggestions, between those artefacts associated with single sex activities and those that involved both men and women (Yentsch 1991:254). From a nineteenth century perspective, women would be most visible in the personal and clothing groups. Yentsch also recommends the division of the kitchen group into items that are employed in food preparation and those that are associated with dining (Yentsch 1991:254) hence the tableware, has been separated from the kitchen category. In this study tableware is defined as any implement associated with dining and the kitchen category consists of any utensils thought to have been used in the preparation of food.

While the historical records indicate that women and children were present at the pearling camps from the beginning of the full scale industry and there is thus no need to test this, it is considered that it would be useful to test the visibility of women in the record. However, as the historical records indicate that there was never a male only population there was no control sample to test the proposed assemblage against. Regardless, the kitchen, personal and clothing categories were grouped

according to this method in order to gauge the visibility of women overall. Therefore the categories that were actually used were as follows.

CLASS NAME
TABLEWARE
KITCHEN GROUP
ALCOHOL GROUP
ARCHITECTURAL
FURNITURE
ARMS GROUP
CLOTHING GROUP
PERSONAL GROUP
MODIFIED GROUP
TOBACCO PIPE
ACTIVITIES GROUP

TABLE FOUR: Artefact categories used in this study.

RESULTS

SITE DESCRIPTIONS - SURVEY 1994

PERON PENINSULA

SITE CAPE LESEUR

AMG REF 742200.7152500

This site is found in red/orange dunes extending the length of the bay behind a stand of mangroves. It consists of a sparse shell scatter of bivalves, worked bivalves, and baler. With this were pieces and bases of worked glass, ceramic, 1 pipe stem and 1 honey chert flake visible on the surface of the ground. Despite the presence of mangroves and species of gastropod, such as Terebralia, the gastropods found in the middens were intact and therefore had not been consumed by humans. There was very little pearlshell but there were the remnants of a dredging basket close to the end of the track. There were also fragments of sandstone grindstones.

The portion of the site in the dunes was the remnants of an Aboriginal camp. Glass ceramic and stone modified by Aboriginal people constituted the assemblage. The proximity of this site to the Pearling Camp suggests that the pearlers were the source of glass and ceramics, possibly in exchange for labour. Harrison (1997) suggests that the camps were used as sources of glass. The presence of both the bases and sides of the bottles in modified form indicates that the camp was a cache of glass material as well as an occupation site.

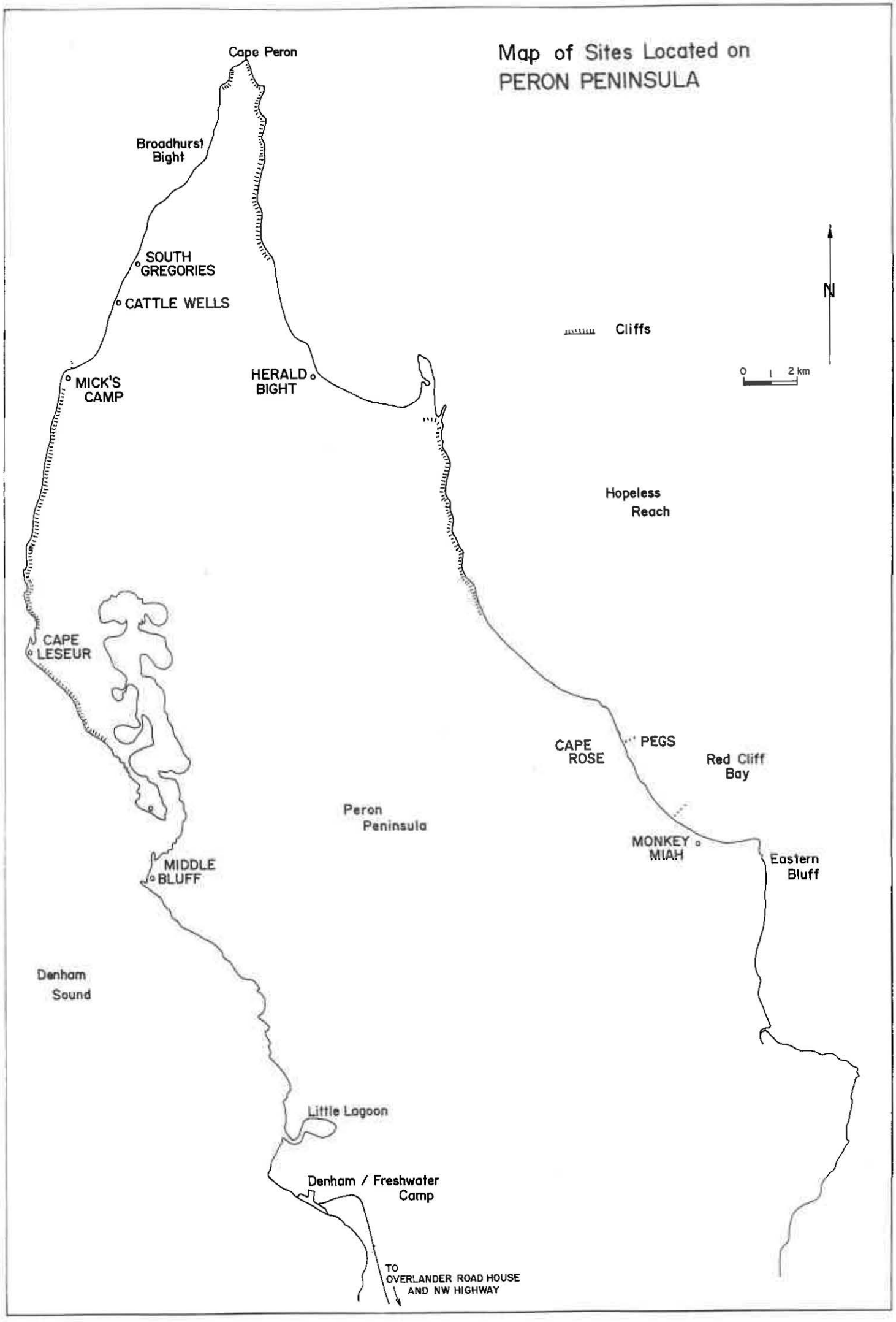
On dunes south of this is a pearling midden proper. It is sparse and obviously compromised by 4wd activity. The remains consist of pearlshell and other bivalves. Oysters, which grow on the rocks at the cape, comprise most of the bivalves. The midden also contains ceramics, metal, broken bottles and baler shell. There was a piece of copper sheathing visible and further down towards the beach are shell remains including a wide range of species. This would indicate that the shell on the beach was deposited by storm activity or that it is dredging waste.

Below this midden area is a mix of pearlshell eroding for about 200 metres out of the dunes on the beach. This midden consists of bleached pearlshell mixed with other bivalves. The midden continues to the north where proportionally more glass and ceramic appear. Everything, however, is obviously disturbed and smashed. The site ends on the rocky part of the cape where there are red bricks and corrugated iron. In the red dunes above this area there are bottles, and some stone and glass Aboriginal artefacts evident. Two attempts to map this site were thwarted by storms. According to Goulder (1990:21) there were significant numbers of Chinese at the Monkey Mia camp and the CSO 5390/84 records a similar situation at Cape Leseur. It would be interesting to see if there were a spatial distinction between the groups discernible and if the different ethnic groups had distinctive cultural material.

SITE MICK'S/BROADHURST'S CAMP

AMG REF 745200.7164200

This site is situated near Broadhurst's Bight on very low lying beach with two birridas (claypans) behind beach dunes. Unfortunately because of the proximity of this site to


Map of Sites Located on
PERON PENINSULA
Cape Peron
Broadhurst Bight
SOUTH GREGORIES
CATTLE WELLS
MICK'S CAMP
HERALD BIGHT
Cliffs
N
0 1 2 km
Hopeless Reach
CAPE LESEUR
CAPE ROSE
PEGS
Red Cliff Bay
Peron Peninsula
MONKEY MIAH
Eastern Bluff
MIDDLE BLUFF
Denham Sound
Little Lagoon
Denham / Freshwater Camp
TO OVERLANDER ROAD HOUSE AND NW HIGHWAY

Denham Sound, it has been exposed to severe erosion. Below high white dunes preceding cliffs to the south, is a water soak and a dense midden of bleached pearl and other bivalves. The midden is very discrete, measuring 10 m x10m. The beach contains several small dune domes that appear to be the result of erosion that has removed the rest of the beach.

There is also a sandstone grinding slab fragment and some fragments of glass. One bottle was positively identified as having been manufactured during the period 1880 to 1920 (Stevens pers.comm. 1994). Near the soak were lots of fragments and pieces of large baler and other large shell species.

SITE MIDDLE BLUFF

AMG REF 747000.7143000.

Similar to Mick's Camp, this site is located on Denham Sound but, fortunately, this site is to some extent protected by a stand of mangroves and by the entrance to Big Lagoon. A pearlshell midden lies between the beach dunes that are enclosed by a point to the south and the mangrove swamps to the north. The midden is fairly dense and spans the beach. The greatest concentration of ceramics, glass and metal is at the southern end of the midden.

The area is lined with Tamarisk trees (*Tamarix aphylla* WA Herbarium) or Athel pines and overall it is a low, open sandy beach. The other side of the point is rocky with steep dunes and no artefactual material although there is some pearlshell eroding out

of a dune. To the north of Middle Bluff, an area south of Cape Leseur looked fairly promising but access was impossible. The beach was wide, and low and sandy, as the pearl midden beaches tend to be, and this could be the camp known as Big Lagoon.

SITE CATTLE WELLS

AMG REF 746600.7167000.

The existence of a pearling camp at this site could not be confirmed by the archaeological remains. There is no pearlshell evident and only a sparse scatter of *Calista* and Baler shell in the low red dunes provide evidence of pre-European occupation. As with Middle Bluff, however, it is a low wide beach and is therefore a perfect situation for nineteenth century pearling.

SITE SOUTH GREGORIES

AMG REF 748300.7170800.

No pearlshell midden material was found at this site either. The dunes are red and low and the beach is narrow and rocky which is not at all suited to a pearling operation, although the water is shallow and sandy. At both Cattle Wells and South Gregories the water is shallow for a shorter distance than at the other pearl beaches. Furthermore, the beaches are not protected by a point or bluff. Whether this influenced the pearlers' occupation or whether it left the pearl middens open to erosion is a matter for speculation. The archaeological survey could not confirm or deny the existence of pearl camps in these beaches. North of these beaches on Peron Peninsula the coast is narrow and rocky and completely unsuitable for camping.

SITE CAPE ROSE/EASTERN BLUFF

AMG REF 767200.7148400.

No pearl shell midden was visible on the surface during the survey. Pegs in the water which may at one stage have bounded the leases or formed a jetty still exist and on the beach itself is what could be naturally occurring pearlshell and tamarisk trees. There are large dunes on the beach, which, as at Monkey Mia, could conceal the pearlshell but this could not be confirmed during the course of the survey. This is a beach area with high potential, however, and if further work were conducted on the archaeology of the pearling industry this is one area that should be examined using test pits.

SITE MONKEY MIA

AMG REF 771500.7144200.

The paradox of this site is the large amount of material that appears thinly disguised beneath dunes in an area that should be heavily disturbed. From the survey observations it was obvious that pearlshell middens exist beneath the surface of this tourist destination. A veritable archaeological treasure trove exists with the most potentially damaging aspect of twentieth century Shark Bay activity. Perhaps it is the close proximity of dolphins, easy fishing and whale watching that has channelled visitor interest away from four wheel driving over the dunes and fossicking on the beach.

Monkey Mia appears in the pearling records very early on. From all accounts it was a large complex site which was favoured for precisely the opposite reason that Wilyah Miah was valued. Monkey Mia has very shallow banks which allow for collection of the shell on foot with no dredging necessary (Goulder 1990:21). The proximity to Freshwater Camp was probably also an attractive proposition as the ventures for fresh water and supplies would have been possible by track, on horse or foot. Prior to 1881 there was a camp populated by 1000 pearlers, 600 of whom were Chinese (Goulder 1990:21). According to Goulder the Chinese camp at Monkey Miah was situated 3 kilometres south of the main camp at an area that became known as Chinaman's bluff.

At the Red Bluff end of Monkey Mia a dense 2 metre x 2 metre patch of pure pearlshell is visible eroding out of the dunes at mid-level height. It actually appeared to have been dug up or uprooted by the vegetation. It is fairly close to the surface of the dune, only covered by a thin layer of sand. No artefacts were visible. Closer to Monkey Mia, again at the mid level of the dune, was less than 1 metre x 1 metre of pearl shell eroding out of the dune. It is suggested that a pearlshell midden now forms the basis for these dunes which have covered the site, and others around the bay.

Further south, on top of white dunes, immediately preceding the red dunes was a site ~30 metres x 30 metres, which consisted of pearlshell on a bed of shell grit. The pearlshell was in various stages of button manufacture (see figure eight). There was a metal circle, about 20cm high, embedded in the sand 2 metres east of the site. There

was also corrugated metal but a few metres away this was found in association with modern material and is argued to be a recent contaminant.

The button manufacture area consisted of pearlshell with perfectly symmetrical rounds removed from the face, and button blanks. Button blanks are the round pieces of pearlshell which have not yet been polished, drilled, carved or attached to shanks to create the button.

SITE HERALD BIGHT

AMG REF 750500.7163500

Herald Bight is a very wide, low lying shallow beach. It is also very disturbed by tourist activity. Jane Winder recalls working at the Herald Bight pearling operation early in the twentieth century for Mr Hughes (Winder 1993 pers.comm.). The 4wd track to the bay bisects the site as the area is a popular tourist destination. Pearlshell midden can be seen eroding out of the walls of the track. This pearlshell was visible in the track for 100 metres and continues along the beach for 500 metres. To the south of the track there is a concrete pad and some pipes. Once again climatic extremes prevented the mapping of this area.

Glass and metal litters the ground and the midden is sparse and disturbed. In the early part of the twentieth century this bay was the site of a fish canning factory (Carmody 1970) which probably accounts for the concrete pad and pipes. The canning factory was an attempt by the people of Shark Bay to overcome the problems of the distance between the bay and the market, and create a viable fishing industry. It was established by Fred Adams to process mullet but within 6 months the fish stocks had deteriorated to the point where the factory was not viable (Lefroy

1978:86). The canning factory and the pearl fishery must have existed side by side earlier this century.

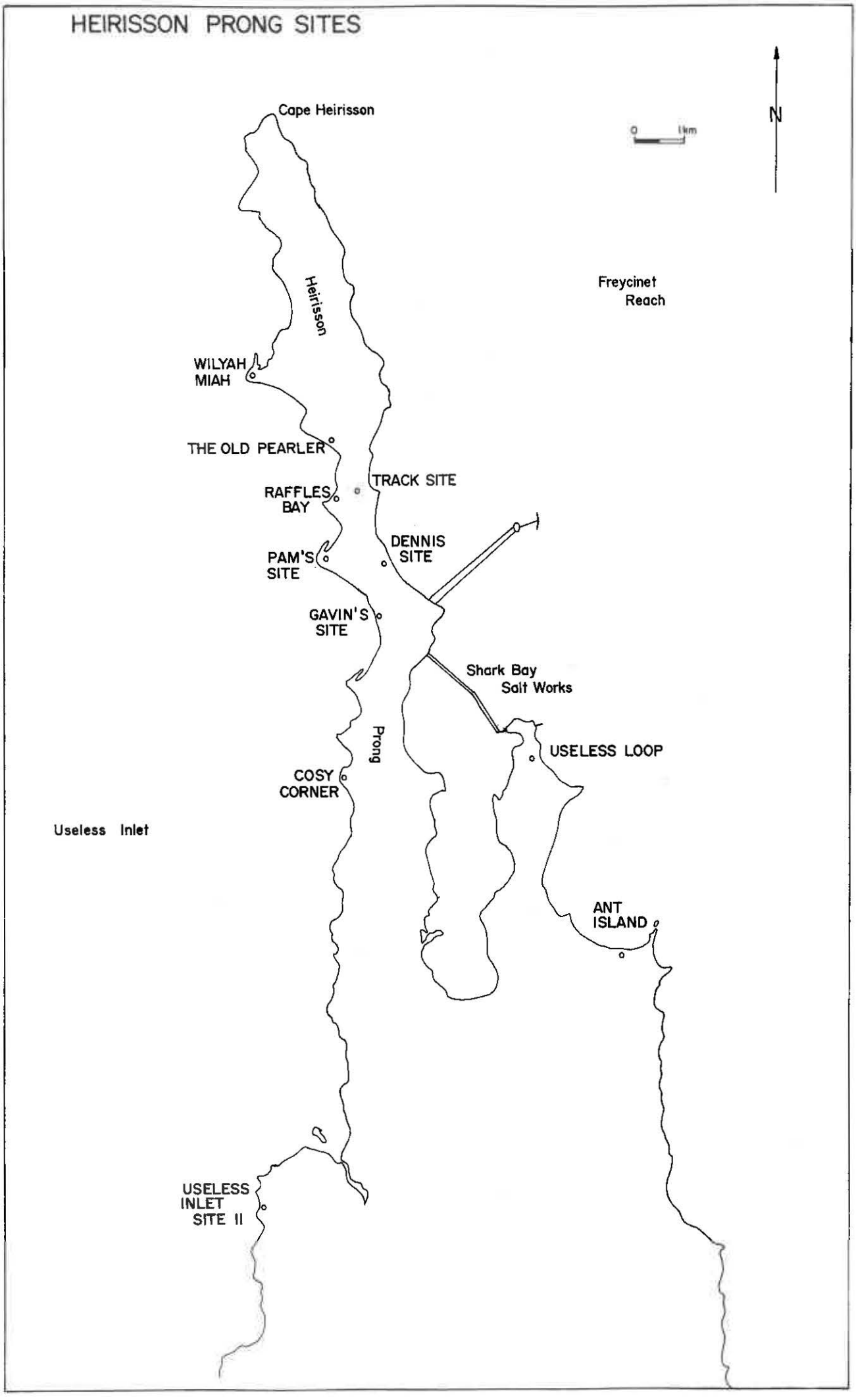
To the north east of the track is a small rubbish heap which consists of bottles, a "Shell" tin can and other twentieth century refuse. There were corroded cooking implements and part of an electrical insulator. This midden may relate to any twentieth century activity within the bight: pearl fishery, fish cannery, local picnic spot and/or tourist destination.

HEIRISSON PRONG

SITE WILYAH MIAH - WILLIMIA POINT.
MUSEUM NUMBER P5960
AMG REF 735800.7115200.

This site was first recorded by Elizabeth Bradshaw of the Aboriginal Sites Department. The Aboriginal component of the site was registered at the Aboriginal Sites Department which is now the Heritage and Culture Division of the Aboriginal Affairs Department.

There is archaeological evidence on the surface of the site that indicates the site was occupied prior to the European arrival in the 1850s. Modified glass suggests that there was Aboriginal occupation of the site at least until the demise of the industry.


HEIRISSON PRONG SITES
Cape Heirisson
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Freycinet
Reach
WILYAH
MIAH
THE OLD PEARLER
TRACK SITE
RAFFLES
BAY
DENNIS
SITE
PAM'S
SITE
GAVIN'S
SITE
Shark Bay
Salt Works
Prong
USELESS LOOP
COSY
CORNER
Useless Inlet
ANT
ISLAND
USELESS
INLET
SITE II

PLATE FIVE: Wilyah Miah Point looking west to Bellefin Prong.

PLATE SIX: Concrete platform at Wilyah Miah.

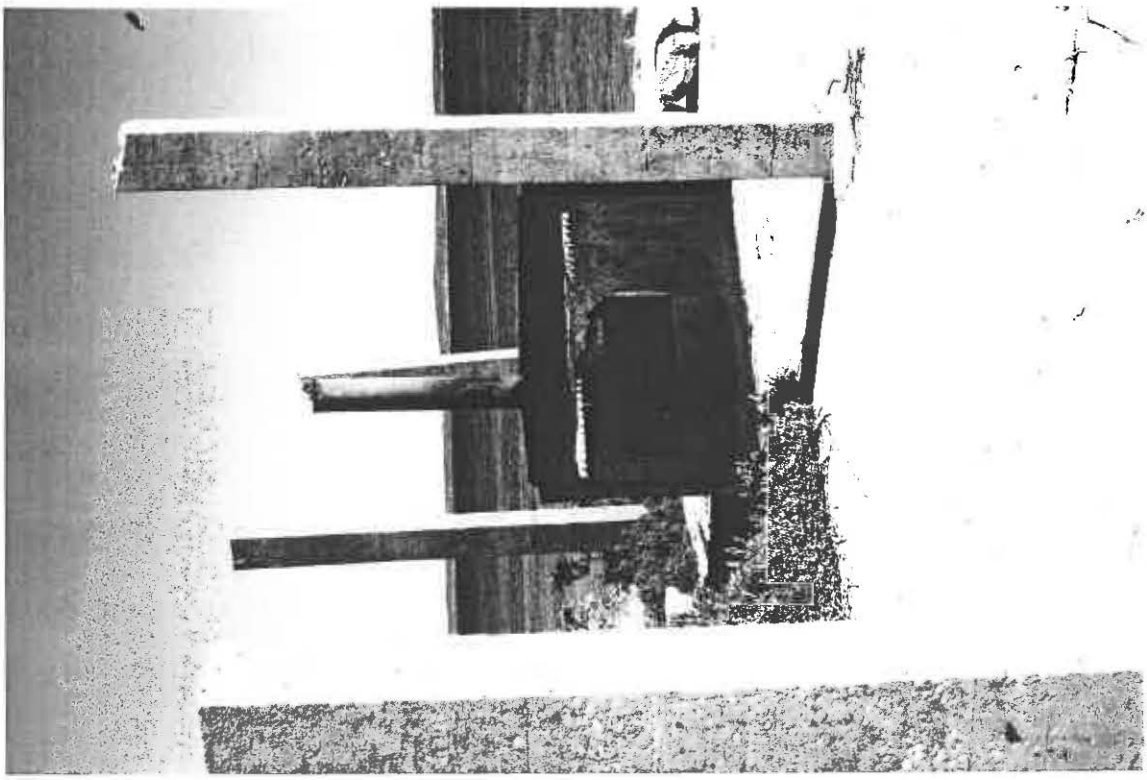


PLATE SEVEN: Wilyah Miah looking north from the dunes.

PLATE EIGHT: Monkey Mia shell button blanks.

Wilyah Miah is the first pearling camp mentioned in the archives and the place name, as described earlier, is a Mulgana term meaning shell place. It was certainly the most successful pearling site and this has been attributed to its ready proximity to the deepest pearl banks (Belotti 1993 pers.comm.). Wilyah Miah has been used in the historical records to describe a stretch of camps which extended for eight kilometres south from Willimia Point (McCarthy 1989:229). The site referred to here is the camp situated at Willimia Point which is the official Anglicised version of Wilyah Miah.

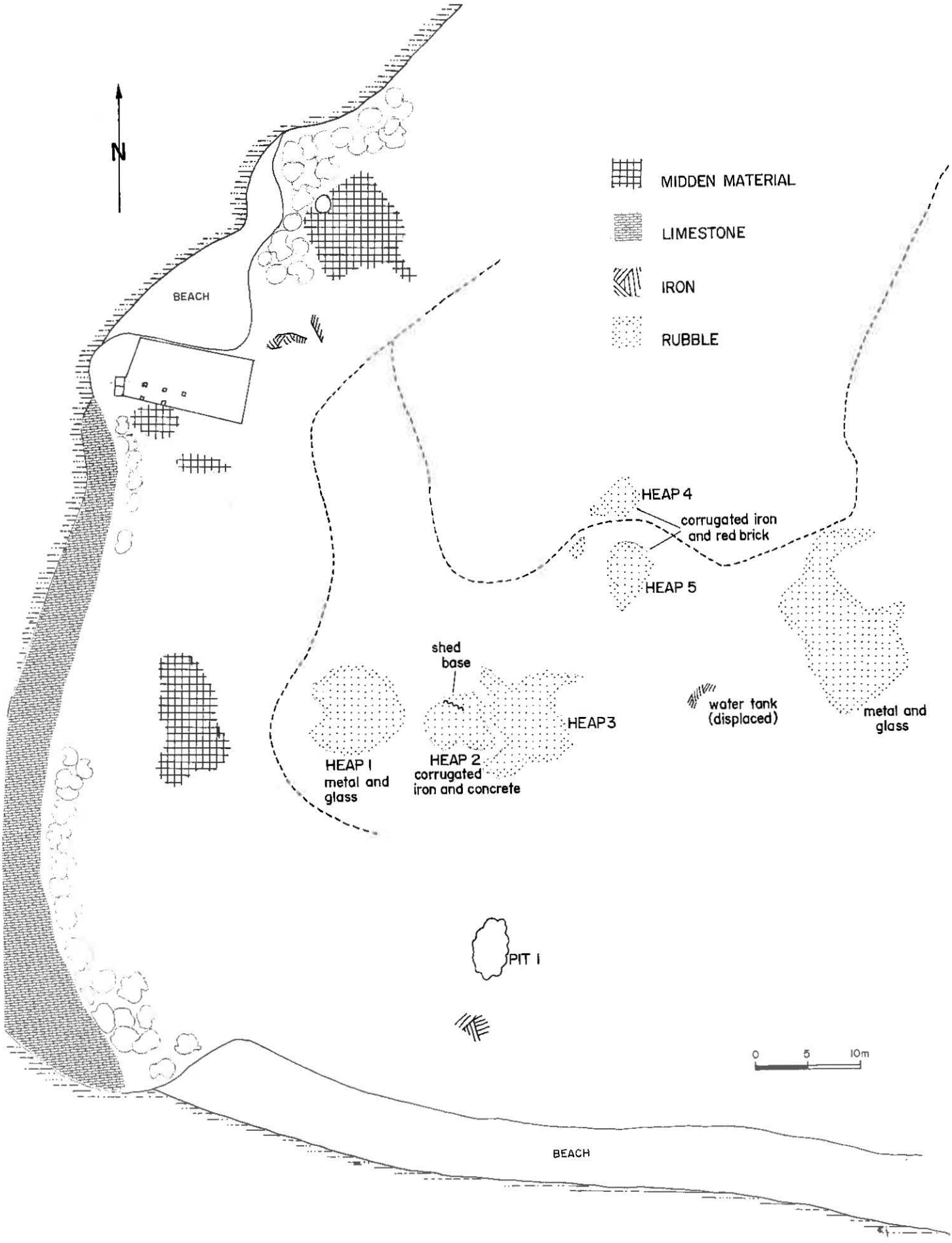
The site has accommodated the camps of Charles Broadhurst in the nineteenth century and, more successfully, Joe Spaven in the twentieth century. Spaven owned the houses at Wilyah Miah (Belotti 1993 pers.comm.) and these were used by the pearlers as a base. Jane Winder (pers.comm.1993) was born at Wilyah Miah. Her father was a pearler there and her mother, herself and siblings worked cleaning the shell during the week. Ms Winder described the houses at Wilyah Miah as "good houses".

The mid to late nineteenth century camp was a large complex arrangement with legions of workers controlled by one pearler with capital backing. For this reason Wilyah Miah witnessed the most substantial structures of all of the sites excepting Freshwater Camp/Denham. Broadhurst and David Scott had a trading store and public house here in the 1870s (Herald February 7 1874).

The nineteenth century houses were constructed for the 'Malay' workers and were made of zinc and wood (Herald February 7 1874). There is nothing to suggest that these houses were not the later ones described by Jane Winder although the presence of concrete witnessed during the survey would suggest that the houses had changed since the simple wooden floored structures described in 1883 in Freshwater Camp. The change in flooring would also indicate indoor cooking facilities which were not apparent in the description of 1880s Freshwater Camp. It is assumed that the descriptions of the Freshwater Camp/Denham structures were relevant to the built environment at Wilyah Miah during the same period.

The site itself is a large, flat peninsula capped by a rocky point with a westerly aspect. The site is bounded on the north shore by a mangrove flat, and on the south by a long, straight beach. To the east the site is defined by high dunes which run parallel to the coast. At the edge of these dunes a large blowout reveals the Aboriginal component of the site. This consists of *Terebralia*, worked glass and stone.

On the rocky point is a concrete pad situated on a calcrete ledge which sits approximately 1.5 metres above a sandy beach. A post embedded in this sand indicates that the concrete pad may have been linked in the past to a jetty or platform. To the east of the concrete pad are heaps of refuse and areas of corrugated iron and concrete. Heap One consists of tiny fragments of metal and smashed bottles.



WILYAH MIAH - Site Plan

Heap Two consists of chunks of concrete, sheets of corrugated iron, parts of a metal "Metters" stove, concrete with corrugations, concrete made with whole pearlshell and concrete set with red bricks. Heap Three is a sparser version of Heap Two.

Further east lie the remnants of a corrugated water tank. And adjacent to this, at the base of the blowout, are two more heaps containing corrugated iron and red brick. The area surrounding these heaps is covered with metal and glass. These heaps suggest living quarters because of the presence of Metters stoves and the amounts of tin can metal littered in the surrounding areas.

There is no obvious pattern of deliberate rubbish disposal, rather the entire area has scattered surface midden. The greatest concentration of the pearlshell midden material was near the mangroves immediately to the south of the concrete pad. Midden material was also visible under the surface of the site in the walls of tracks and pits dug before the archaeological survey by persons unknown. Because this is a registered Aboriginal site excavation of the area was not permitted. A surface collection was made, however, in 1993 with Professor Bowdler who held a permit to excavate and, collect from, Aboriginal sites in the Shark Bay area.
The beach forming the northern margin of the site is littered with scrap metal that may have formed part of a winch system.

SITE RAFFLES BAY - BOTTLE BAY - SOUTH CAMP

AMG REF 737500.7113500.

The site was named by the author who subsequently discovered that in local lore this beach is known as Bottle Bay. Local sources claim that the beach is a repository of old collectible bottles which have washed up from a shipwreck in the Bay. The survey indicated that the bottles were eroding out of dunes on the beach which looked suspiciously like they may conceal pearl shell midden although this has not yet been confirmed by systematic excavation. Closer inspection of the artefacts from the surface collection, however, revealed that they are all salt damaged which lends credence to the local legends.

A small rockshelter in the southern end of the bay was test pitted as part of Bowdler's Shark Bay Project. One 1m x1m test pit was dug in five spits, the base of which reached a sterile layer of beach sand and roof fall. Cultural material in the deposit was found to relate to the pearling era of Shark Bay rather than the pre-contact era, so the artefacts were analysed as part of the Wilyah Miah project. It is thought that the material found in the rockshelter was there as a result of water action scouring the beach and redepositing the midden material. It is doubtful that the pearlers made use of the rockshelter for camping or industrial purposes. Basically the deposit consisted of pearlshell, sea grass and metal fragments.

SITE COSY CORNER - TUNDENERRA

AMG REF 738000.7107400.

Cosy Corner is a popular camping and boating beach for the residents of Useless Loop. It is a large sweeping bay with a boat ramp and a parking area. According to Al Liezenga this site was the real Fry's Camp (Al Liezenga Pers.comm. 1994, Fry 1988:14). South of the point which accommodates the boat ramp is a narrow beach and high, steep dunes. Eroding out of the middle of the dunes at various places along the beach was a mixed midden of yellow pearlshell. It appears the pearlshell midden has been covered by the dunes. In the dunes behind the site dunes is an Aboriginal site with modified glass pieces and baler shell.

SITE MANGROVE BAY - PAM'S SITE.

AMG REF 737500.7111500.

At the southern end of Mangrove Bay there is a rocky point which is thickly littered with midden material. Two pieces of china which could be conjoined were also present. It is contended that this midden is composed of material that has washed up in the bay as a mangrove stand and rocky point seem highly inappropriate features on which to base a pearling operation. This is based on observations of other sites in the bay. The name Pam is derived from another Shark Bay Salt Joint Venture employee who directed us to the location of the material. Apparently collecting china from the beach is a favoured local past time.

SITE USELESS INLET II - THOMPSONS CAMP

AMG REF 738000.7099500.

Useless Inlet 2 is a rockshelter site in the same area (Martin 1992). Here we found an extremely sparse scatter of pearlshell, other bivalves and some ceramic and glass fragments. It would appear that if there was a site here, as the historical records suggest, then it has been severely eroded.

SITE DENNIS' SITE.

AMG REF 738400.7112300.

On the beach north of Slope Island in the interdunal swale is a very sparse scatter of pearlshell and some bottles. There is *Syrinx* and bottle glass and metal such as the base of a square tin. This extends for approximately 50 metres. Further south is a discrete area of modified glass. (In one scatter are 1 glass core - 40mm x 40mm, 2 complete flakes - 25mm x 20mm & 40mm x 35mm, plus one flake fragment and three pieces of debris.) There is more flaked glass on top of the dunes. This site is below HP midden 21.

It is assumed that because the beach here faces Denham Sound, this site has been less protected than the sites edging Useless Inlet. This would account for the poor preservation of the midden, if a more substantial one ever existed.

SITE TRACK SITE.

AMG REF 738300.7114000.

North of Slope Island, eroding for about 20 metres out of the track on top of the high dunes is mixed pearlshell midden and sheets of metal (some corrugated). This is high above sea level and above a narrow, cliffy and rocky beach. To the north of this is a beach with a very sparse 1mx1m scatter of pearlshell.

The altitude of the site, its proximity to no known or recognised pearling camps or even areas suitable for such activity, and its position on the track suggest it is not a pearling site. It may be a dumping ground or an isolated episode of rubbish disposal (HP Pearlers Midden 2 SB 32). It is tempting to ascribe this site to the transportation of pearling refuse and pearlshell. The recycling ethic within the bay is well recognised. The removal of pearlshell and corrugated iron for construction purposes elsewhere could have resulted in spillage somewhere along the track. It is hard to imagine, however, why this material would not have been moved by boat.

SITE ANT ISLAND.

AMG REF 743000.7103500.

On a long, flat, wide beach immediately north of Ant Island is an exceptionally sparse midden. One fragment of glass and two pieces of corrugated iron were visible. Once again the aspect of the site, facing Denham Sound, appears responsible for the

condition of the site. It is contended that the area may have been used as a Pearling Camp but has been eroded to the extent that this can no longer be confirmed.

SITE USELESS LOOP SOUTH.

AMG REF 742000.7106900.

At the southern end of the township of Useless Loop in a wide sweeping bay with a generous but flat beach is some pearlshell midden eroding out of low dunes. Similar to Ant Island and Dennis' Site, this area faces Denham Sound and this, coupled with the construction of the salt mine township, is obviously not conducive to the preservation of the midden material.

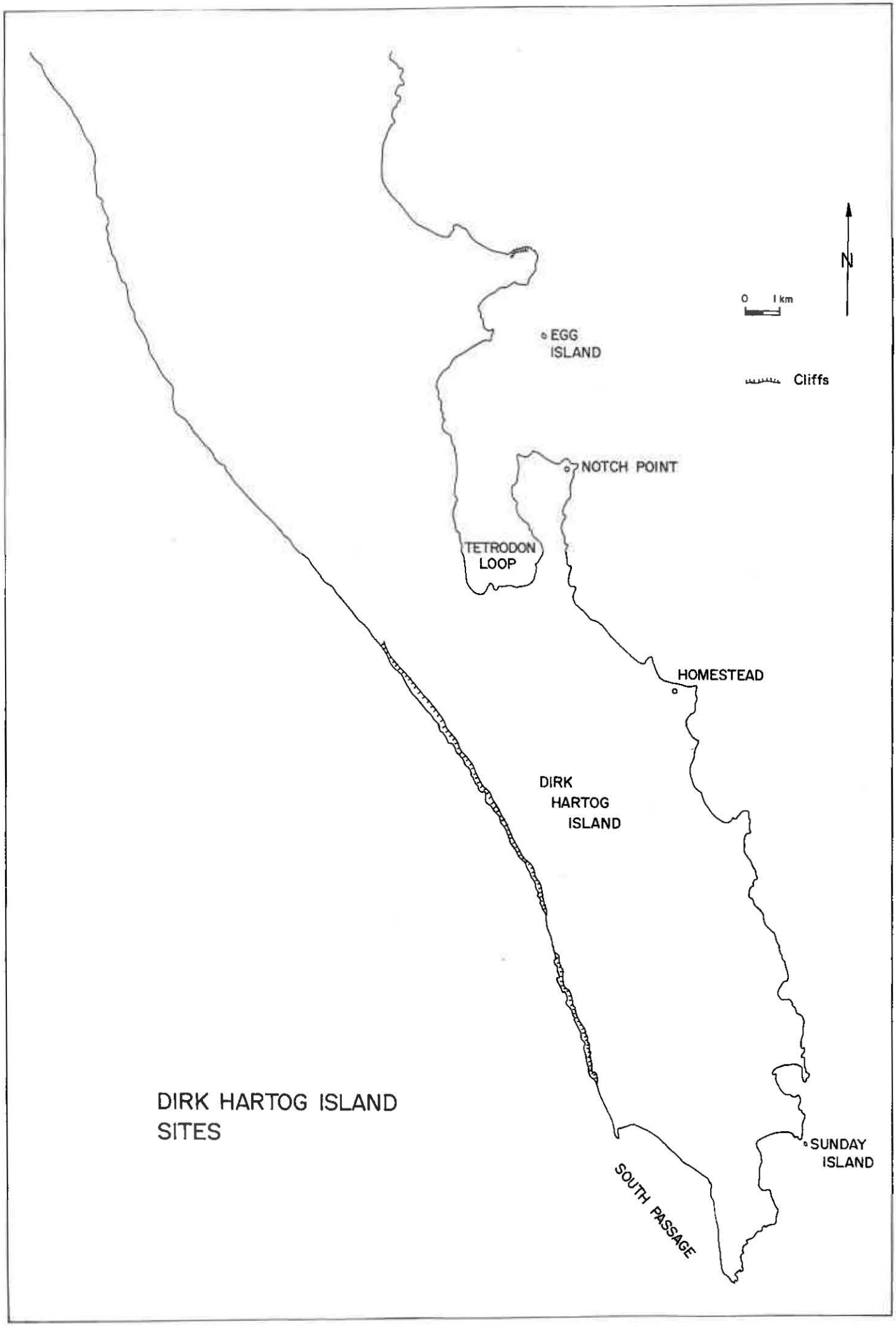
DIRK HARTOG ISLAND

SITE NOTCH POINT.

AMG REF 716700.7128700.

On the north eastern coast of Dirk Hartog Island, convenient to the pearlshell banks is a notched point. This was the site of the 1886 battle between the Chinese and the European Pearlers. According to Michael McCarthy of the WA Maritime Museum the Chinese camped on one side of the point and the Europeans camped on the other.

Unfortunately we were prevented from investigating the area intensely because permission for access from the current pastoralist was denied in writing before the 1994 survey began.



DIRK HARTOG ISLAND
SITES

In 1993, however, with Professor Bowdler, who was examining the area for signs of Aboriginal occupation, the beach was explored in the course of one afternoon. During this cursory examination the two flat beaches that comprise the point were found to contain scatters of pearl shell, some ceramics and large amounts of glass. No midden mound was visible.

SITE HOMESTEAD SITE.

AMG REF 720000.7122000.

South of the Historic Dirk Hartog Island Homestead is a sparse scatter of pearlshell. Whether or not this was a pearling camp could not be determined in the time frame of the survey. Because of the ready availability of large amounts of pearl shell in the form of middens, the use of pearl shell to reinforce an area of traffic in a settlement with few roads is not unknown (Fry 1988:11). Pearl and other species of shell have been used in the historic period of the Bay to surface roadways, work areas and pedestrian paths. This theory could not be tested in the time available for fieldwork.

EXCAVATED SITES

The problem with excavating middens is the sheer amount of artefactual material that is recovered. Often literally every square centimetre of deposit is artefactual, all of which requires documentation if not removed for analysis. The method adopted in this research to interpret the midden material, was to sample the shell, this forming the majority of the midden. This follows Bowdler's recommendations that:

> Where all the shell (or other small abundant remains) is not retained during excavation small samples need to be acquired. These may be solid samples, which, are unsieved, or shell samples, which have been sieved in the field (Bowdler 1983:138).

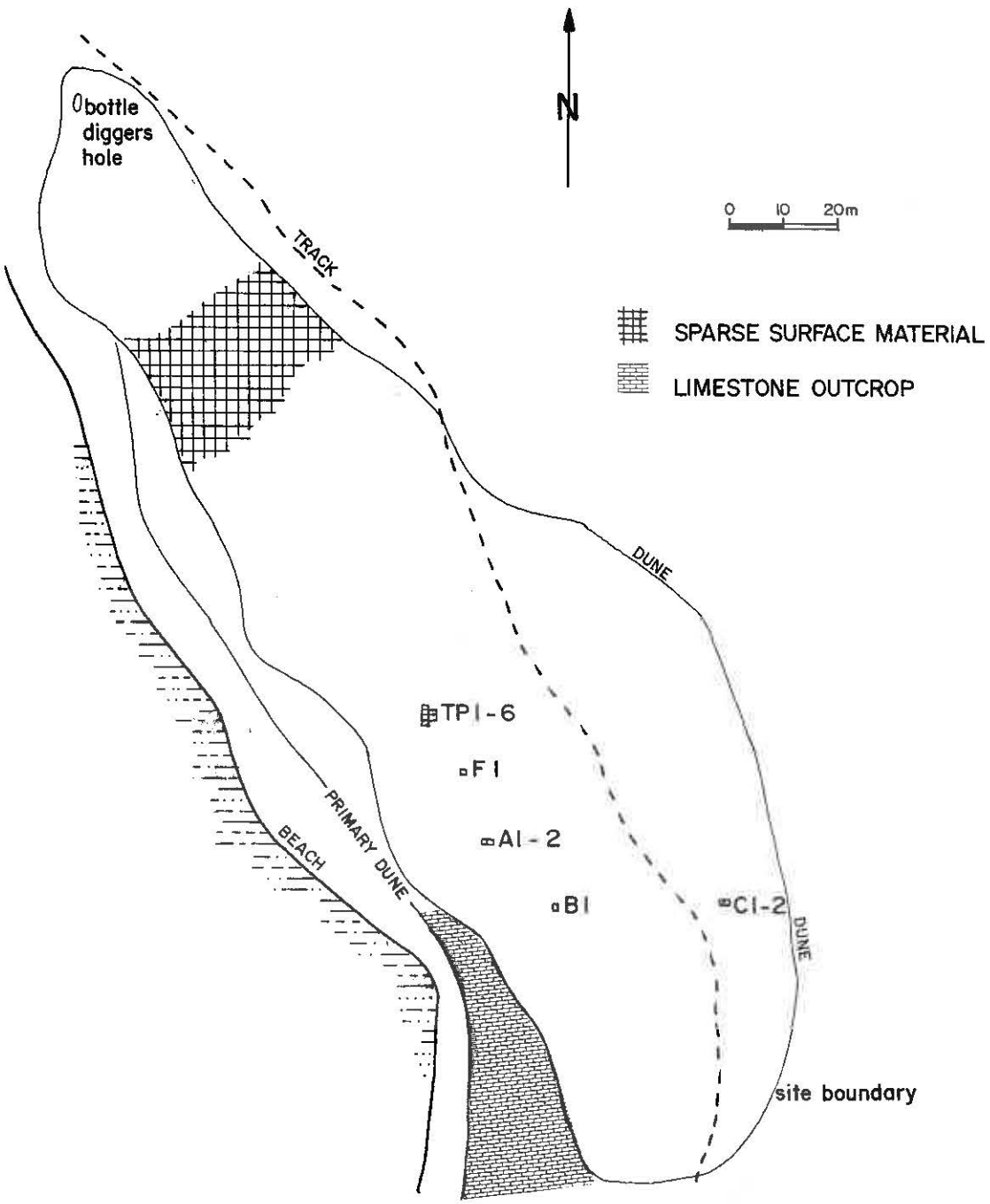
Consequently at the Old Pearler site, when the excavation extended below spit seven (in test pit one), only artefactual material other than pearlshell was retained after sieving. At Gavin's site, the first bucket of every square was retained as a representation sample. Again the remainder of the material was sieved and the non shelly material retained for analysis.

SITE: THE OLD PEARLER - YANKEE TOWN.

AMG REF 737000.7114500.

According to Al Liezenga, this site was the real Cosy Corner Camp (Liezenga pers.comm. 1994) and on a map of the pearling leases it is labelled 'Yankee Town'. The site is now locally known as the Pearler's Camp and was known as a source of china and glass. Useless Loop locals boasted of finding entire dinner sets at the camps. For this reason it is assumed that much surface material has been removed from the site. This selective removal of material presumably skewed the results for the surface collection in this research although it is further assumed that collecting has occurred at most sites as beach combing and fossicking are popular local recreational activities.

THE OLD PEARLER - Site Plan



Surface inspection of this site revealed large amounts of glass bottles, earthenware bottles, china and flaked glass. The beach at this site is defined by rocky points to the north and south, and to the east by a tall sandy ridge (see figure eight). It appears that the entire beach is raised above the water level by the midden deposit. A coastal track cuts through the site, with the ridge to the east and the coast to the west.

SURFACE COLLECTION

The surface collection was divided into categories according to approximate locations within the site. These categories are: TOP - C2 - Surface, East Base Unstratified, South Ridge Unstratified, East Ridge Unstratified, Central Ridge Unstratified, ET Unstratified, and C1-2 Unstratified.

The majority of artefactual material was collected from the ridge above the site. Whether this was because this area was previously ignored by the fossickers because of its distance from the track, or whether more material was deposited here by the pearlers themselves is unknown. The area may have been part of the European camping area. The presence of a thicket of tamarisk trees, which are an introduced species used in the historic period as a windbreak, supports this idea. Further test pitting may confirm this.

It seems unlikely that ceramics would have been deposited at a distance from the camp for reasons of hygiene. The presence of bottles on top of the ridge may indicate that the dune was a pleasant drinking area. This does not explain the table

ware, however, and it could, save for the lack of worked pieces, be attributed to Aboriginal stockpiling of ceramics for knapping.

EXCAVATION

The Old Pearler site was excavated by Sandra Bowdler from the Centre for Archaeology at the University of Western Australia. because it was a site known locally as a pearling area and a repository of historical bric-a-brac. One 6x2m trench was excavated in the main midden area (test pits 1-6). A further two 1x1m test pits (F1 and B1) and two 2x1m trenches (A1-2 and C1-2) were excavated with limited success further south (see figure nine). The trench was excavated using arbitrary spits of approximately 5cm when no stratigraphic divisions could be seen, but following observable stratigraphy when it was evident. Material was sieved through 3mm mesh and artefacts bagged in the field.

Test pits 1-6 were opened on the highest point of the beach. Squares one to four run from north to south with square five on the eastern side of square two and square six on the eastern side of square three (see figure nine). Square F1 was placed 20 metres south of this trench because of the presence of rocks which were thought to be a feature. This test pit contained a hearth feature and sparse cultural material but did not have the same quantity of cultural or midden material as test pits 1-6.

Square A1 was placed 15 metres to the south of F1. This was opened into two squares, A1 and A2, which revealed a sandy deposit of loose shell and some cultural

material. Square B1 was dug 25 metres south of A1 and A2. This square also revealed a dense shelly layer but little other cultural material. This square was abandoned after sterile sand was revealed at a depth of 28cms in spits six and seven. Squares C1 and C2 were opened to the east of the track which bisects the site. C1 revealed shell and other cultural material but C2 contained very little artefactual material.

STRATIGRAPHY - THE OLD PEARLER TEST PITS 1-6.

The western wall of test pits 1-4 and the eastern wall of test pits 5 & 6 are illustrated in figure ten. The trench was situated on a vegetated portion of the dune in the middle of the midden area in order to sample part of the midden that had not been as extensively eroded. The sandy over burden was removed in five centimetre spits following a natural incline to the west. Below this the midden material was reached at a depth of 17 centimetres, also sloping to the west. This was removed in arbitrary five centimetre spits (see spit/layer correlation table below).

	Pit 1	*Pit 2*	*Pit 3*	*Pit 4*	*Pit 5*	*Pit 6*
SURFACE	0	0	0	0	0	0
TOP LAYER	1-4	1-3	1-2	1-3	1	1-3
MIDDEN LAYER	5-7	4-5	3-5	4-6	2-3	4-5
SAND LAYER	8		6	7-8	5-8	6
CHARCOAL LAYER		6	7			7

SAND LAYER						8

TABLE FIVE: The Old Pearler test pits 1-6 SPIT/LAYER correlation

The midden material was dense and homogenous in profile. Above and below this midden layer were occasional concentrations of charcoal, and a charcoal rich grey layer extended through the sterile sandy layer below the midden material (see figure ten). A bottle collectors pit (marked in figure ten as 'hole') perforated the sandy overburden in pit 3 but stopped at the midden layer, possibly because of the labour involved in digging midden material. Artefacts and pieces of marine shell were in the deposit from the first spit but continue into only the top layers of the sandy matrix below the midden. It is possible that the presence of the artefacts in strata below the midden is a result of vertical movement of artefacts through the deposit.

FINDS

The Old Pearler site has produced what appears to be a mix of industrial waste and domestic refuse in the midden. The faunal remains were dominated by the invertebrate category (26153g). The terrestrial faunal remains comprised a smaller proportion of the bone category (1903g) while the marine vertebrates comprised an even smaller proportion (811.23 g). The sheep/goat category constituted 91% of the terrestrial fauna with small amounts of the other animals; cattle (4%), macropod (4%) and bird (negligible).

Category	*Weights (grams)*
Invertebrates	26153.10
Vertebrates	1903.82
Artefactual material	490.98

TABLE SIX: Total weights of all finds.

The artefactual material uncovered in the deposit consists of leather, ceramics, wood, glass and metal. The dominant component by weight was the metal category (9111.8 g), followed by the glass (2076g), ceramics (488.86 g) and wood (2.12g). The metal category consists of kitchen refuse such as tin cans and lead capsules, items associated with boats such as copper sheathing and sheathing tacks, and architectural artefacts such as nails. There is also part of a harmonica. The ceramic category includes predominantly tableware with few kitchen and personal wares. Alcohol bottles constitute the bulk of the glass category with some kitchen bottles and plate glass.

The material collected from the surface of the site only includes glass, ceramics, shell and metal. The discrepancy between the open and excavated assemblages is easily explained by the more exhaustive recovery techniques of the excavation. A full list of the contents of the midden is included in the appendices.

	UNSTRATIFIED	*EXCAVATED*
Ceramics	48	14
Glass	24	12

Wood	0	1
Leather	0	3
Metal	5	285

TABLE SEVEN: Numbers of fragments of major artefact classes from the Old Pearler.

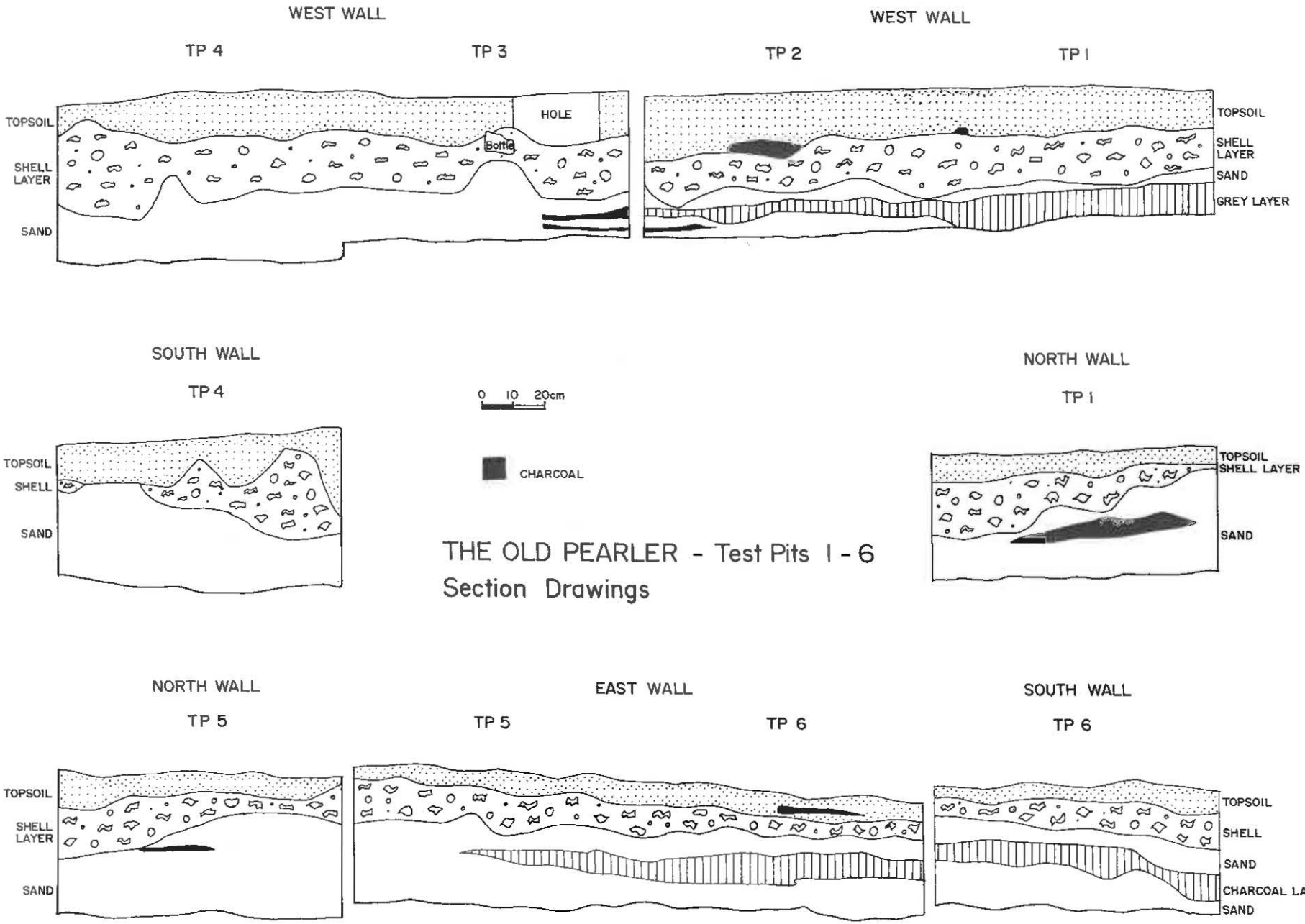
There are no ethnically distinct assemblages. A total of thirty two Aboriginal artefacts were found in the camps, only four of which were found in a stratified context, all at the Old Pearler. The artefacts are all pieces of debitage. Three are made of stone, one of ceramic and the remainder are made of glass. Two of the stratified artefacts are stone and two are glass.

Two pieces of ceramic can be reliably ascribed a Chinese origin. These are one earthenware vessel found at Heirisson Prong 21 open site and two pieces of a white glazed, hand painted, bowl type vessel from an unstratified context at Mangrove Bay. No Chinese artefacts were found in stratified contexts.

Conjoining or refitting

> ...entails attempting to put tools and flakes back together again, like a 3 D puzzle...to follow the stages of the knapper's craft and - where pieces from one core have been found in different areas - even the knapper's movements around the site." (Renfrew 1991:282)

'Conjoin' is not used in this study as strictly as in the above definition. Ceramic and glass pieces with the same shape, raw material, colour, decorative pattern and makers mark are assumed to derive from the same supplier, if not, indeed, the same service.


WEST WALL
TP 4
TP 3
TOPSOIL
SHELL LAYER
SAND
HOLE
Bottle
WEST WALL
TP 2
TP 1
TOPSOIL
SHELL LAYER
SAND
GREY LAYER
SOUTH WALL
TP 4
TOPSOIL
SHELL
SAND
0 10 20cm
CHARCOAL
NORTH WALL
TP 1
TOPSOIL
SHELL LAYER
SAND
THE OLD PEARLER - Test Pits 1 - 6
Section Drawings
NORTH WALL
TP 5
TOPSOIL
SHELL LAYER
SAND
EAST WALL
TP 5
TP 6
SOUTH WALL
TP 6
TOPSOIL
SHELL
SAND
CHARCOAL LAYER
SAND

Pieces were not necessarily fitted together. All but two of the conjoins are ceramic. The two exceptions are made of glass. The lower number of glass conjoins are a result of the application of the above criteria, which were applied more stringently to glass artefacts as the bottles found in the bay appeared to be more generic and therefore made matching the fragments meaningless. In other words, it was assumed that bottles, particularly those used to hold alcohol, were owned by everyone. The ceramics, however, which were slightly more distinctive could be attributed to personal preference. Therefore the distribution of one type of ceramic around the bay was thought to indicate the movement of one pearler around the bay.

The interesting aspect of the assemblages analysed from sites around the bay is the uniformity in the ceramics which suggests a limited range of wares available to the pearlers. Alternatively it could suggest the movement of pearlers between the camps as in the "poor man's diggings" (Lawrence 1995).

ARTEFACT 1	**ARTEFACT 2**
Cosy Corner-Us-1	The Old Pearler-Us-Et-10
Heirisson Prong-21-18	The Old Pearler-Us-Et-1
Gavin's Site-Us-1	Heirisson Prong-21-17
Middle Bluff-Us-10	The Old Pearler-Us-Et-4
Heirisson Prong-21-7	Middle Bluff-Us-12
Cape Leseur-Us-3	Heirisson Prong-21-2
Cape Leseur-Us-5	The Old Pearler-Us-9

Cape Leseur-Us-9	The Old Pearler-Us-C-8
Cape Leseur-Us-10	The Old Pearler-Us-5

TABLE EIGHT: Conjoin artefacts showing assumed links between sites.

SITE GAVIN'S SITE

AMG REF 738300.7110300.

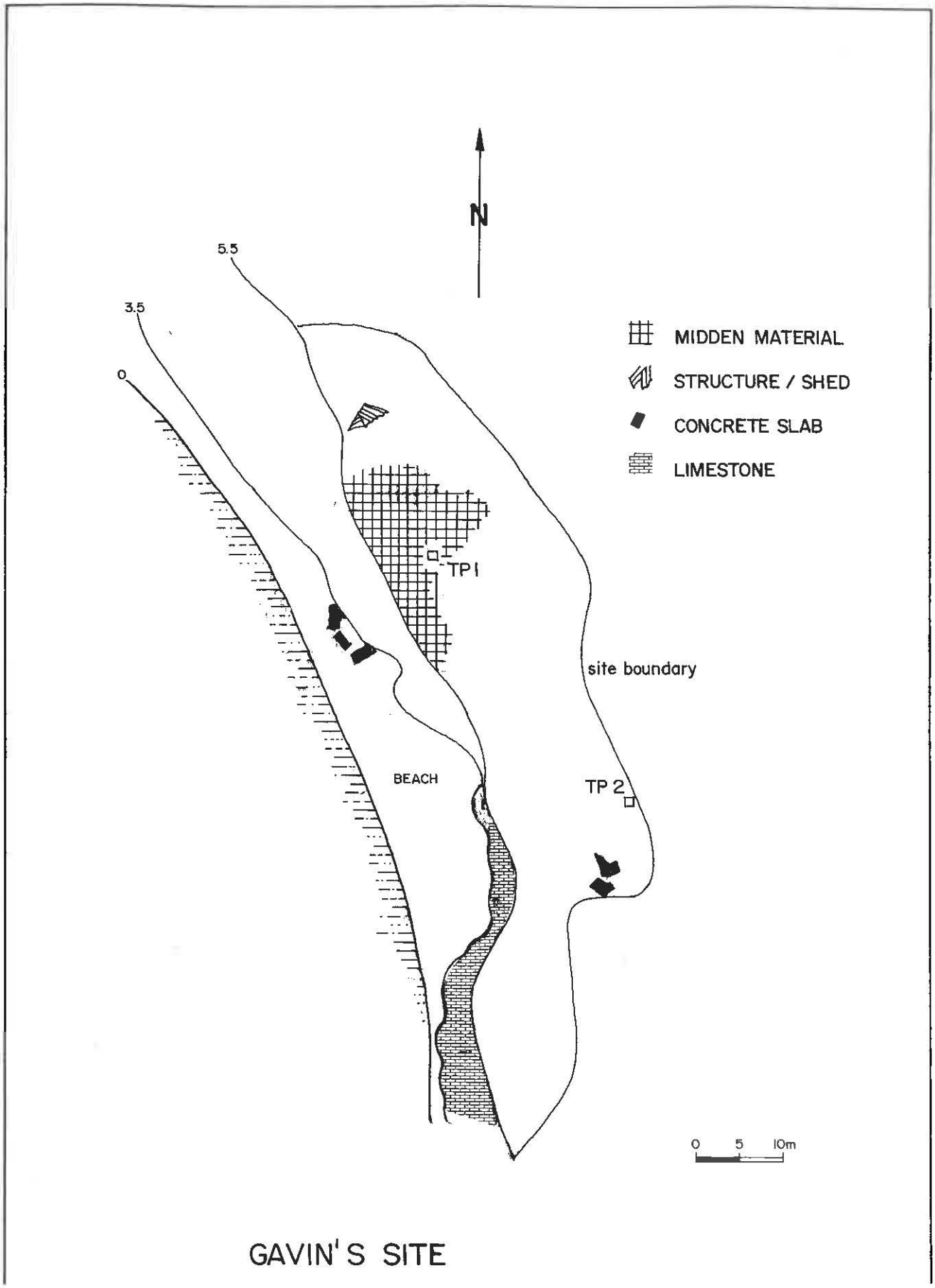
This is the most pristine of all the observed sites. As with most of the Heirisson Prong sites, this area has been largely protected from tourism and 4WD vehicles. Access is limited to pedestrians and boats as the site is located at the base of very steep dunes. It was named after Gavin Privett, Useless Loop Joint Venture's industrial chemist who first found the site. Six discrete areas were discerned within the site.

1) Corrugated iron and concrete defined an area that contained chicken wire, tin cans, a metal wood stove, wood, 2 concrete slabs (1mx1m), cream coloured bricks, red bricks and sheets of other metal. It is assumed that this formed the basis of the domestic sphere.
2) A heap of debris included a mound of sand with metal fragments, bottles, a few bricks and chunks of concrete. It would seem that this would relate to the removal of structural materials from the camp after it was abandoned.
3) Another area of corrugated iron similar to Area One also contained part of a metal cooker (possibly part of the same wood stove), chunks of concrete and a metal can. Again this appeared to derive from the abandonment of the camp.

4) North of the main pearl shell midden a separate area of corrugated iron, wooden struts and chicken wire. The corrugated iron is embedded in the ground indicating that it may have formed walls here. This small structure may have been a work shed associated with the cleaning of the shell.
5) The main pearlshell midden which forms a mounded barrier between the apparent domestic areas and the work shed.

The site was chosen for excavation because it was less disturbed than other sites, exhibited distinct industrial and domestic areas and, according to local people (Bert Wedding, Al Liezenga and Kathy Oakley) and surface artefacts, post dated the Old Pearler site. It was intended that this site would provide the chronological comparison to The Old Pearler, which, as it is the site of Yankee Town, was known to be occupied by pearlers last century.

Two areas of the site were test pitted, sieved through 3 and 5mm mesh and bagged separately. The deposit was brushed and sorted in the laboratory and diagnostic pieces were labelled and registered for identification. During the excavation in 1995, uncharacteristically high rains lashed the coast. The adjacent salt mine lost in excess of two million dollars worth of stock piled salt in one week. The parts of the midden and beach dunes fronting the inlet were literally washed away during the field project.


N
5.5
3.5
0
MIDDEN MATERIAL
STRUCTURE / SHED
CONCRETE SLAB
LIMESTONE
TP1
site boundary
BEACH
TP 2
0 5 10m

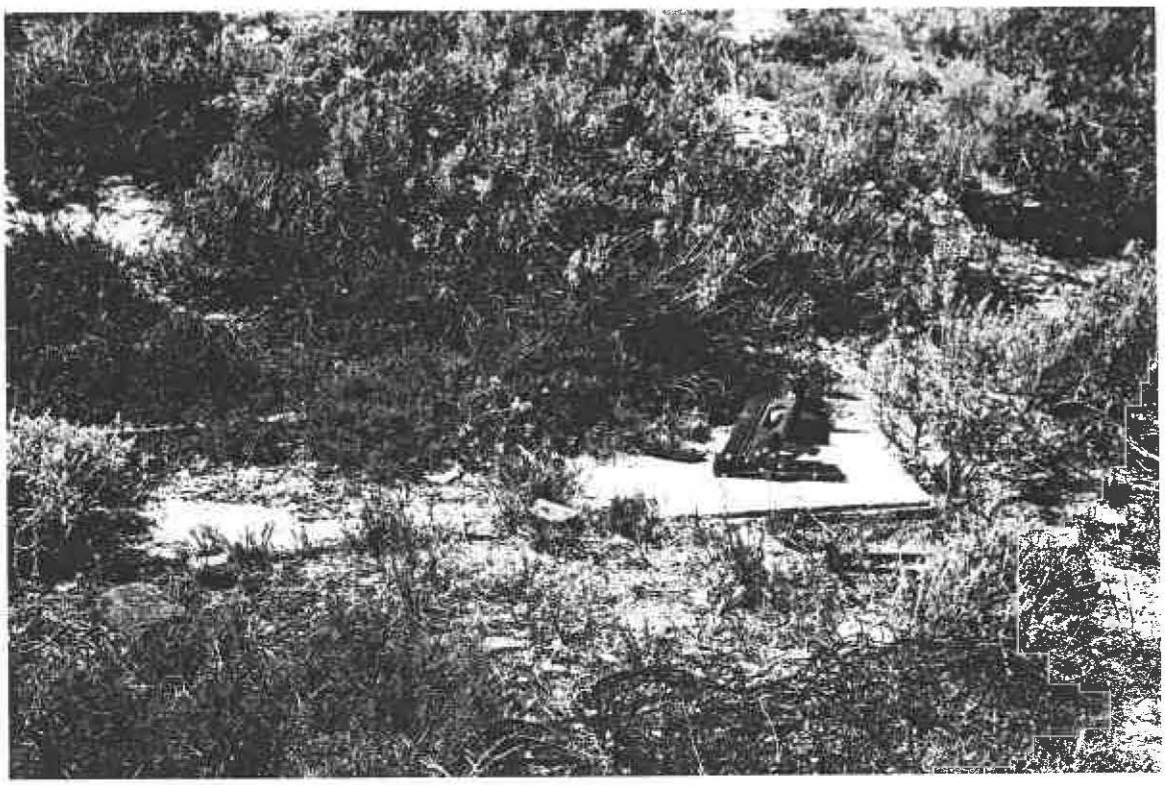
GAVIN'S SITE

PLATE NINE: Gavin's Site.

PLATE TEN: The midden at Gavin's Site.

PLATE ELEVEN: Corrugated iron foundations at Gavin's Site.

PLATE TWELVE: Concrete and domestic refuse at Gavin's Site.



The weather revealed pearlshell material eroding out of the front of the dunes, confirming earlier observations that some pearlshell material appeared to be beneath mobile dunes. The erosion also revealed parts of a crumbled concrete slab that would have sat right above the high tide mark (see figure eleven). This may have formed a landing bay for the collected pearl shell from the boats.

STRATIGRAPHY - GAVIN'S SITE TEST PIT ONE.

Test pit one was situated on the southern margin of the visible midden material in order to gain a relatively undisturbed sample of the shell deposit. The pit is a 1x1 metre square aligned north south and was approximately 1 metre deep.

The first layer excavated was a thin lens of beach sand followed by a thick sterile layer of sand formed from the shell nacre and the shell itself (see figure twelve). The midden material is immediately below. Beneath this is a sterile sand layer and a charcoal layer. The pink nacreous soil continues throughout the midden material. The midden layer consists of a dense, homogenous deposit of shell and the above mentioned nacre.

Layer	*Average depth (cm)*	*Spit numbers*
SAND	3	1
NACREOUS	29	2-9
MIDDEN	40	10-22
SAND	19	23-26

CHARCOAL LAYER	5	27-28
Total depth	93	

TABLE NINE: Gavin's site test pit one: spit: depth correlations.

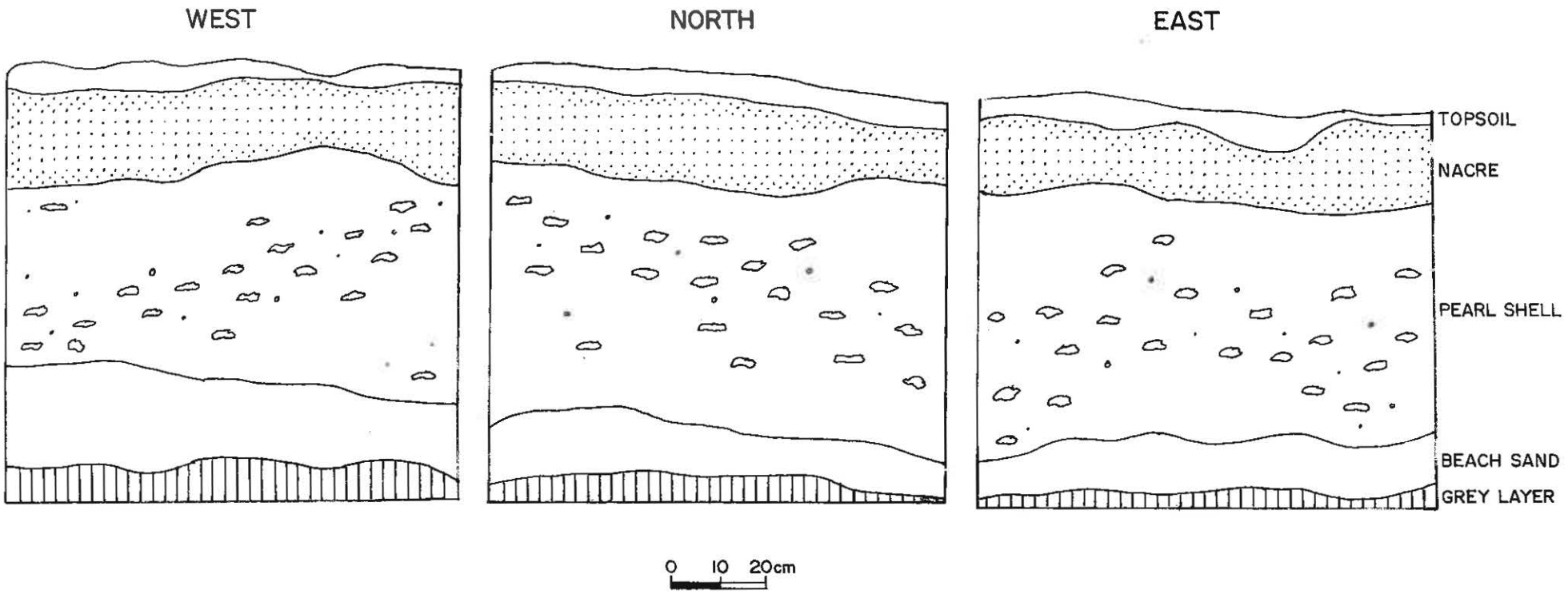
STRATIGRAPHY - GAVIN'S SITE TEST PIT TWO.

This test pit was situated on the mound of metal and sand near the concrete slab and "Metters improved cooker" (see figure eleven). It was thought that this area, as it was close to what appeared to be the foundations of a living area, might reveal the remains of the pearlers' domestic refuse.

Layer	*Average depth (cm)*	*Spit numbers*
SURFACE	0	0
METAL LAYER	48	1-16
FEATURE ONE	5	17
SAND LAYER	25	18-24
Total depth	78	

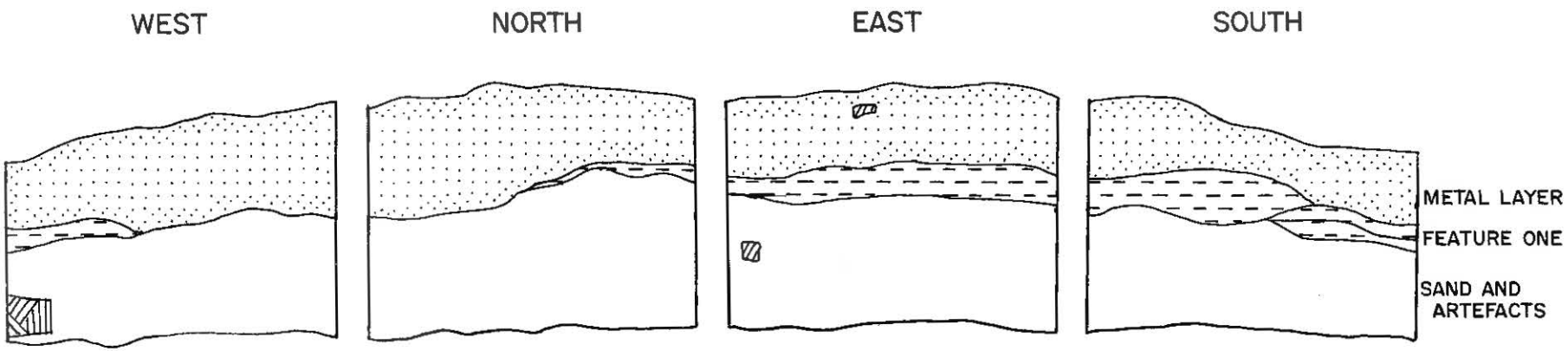
TABLE TEN: Gavin's site test pit two: spit: depth correlations.

Test pit two is a 1x1 metre square aligned north-south and was approximately 80 centimetres deep (see figure twelve). The stratigraphy begins with a reddish yellow sandy layer which seemed to owe its colour to the large amounts of eroded metal fragments present (see figure number twelve). This ends at a thin lens of charcoal in a greasy, grey matrix which is interpreted to be the evidence of a fire though whether it was a deliberate fire and if so for what purpose cannot be said.



GAVIN'S SITE - Test Pit I - Section Drawings

GAVIN'S SITE - Test Pit 2 - Section Drawings



Below this the artefacts continue in a sandy matrix. The excavation ended after two sandy layers revealed no artefactual material.

FINDS

Because the areas within the camp were so well defined, it was decided that it would be easy to locate the domestic area to gain a comparison of this material to the midden material. As it turned out, unlike The Old Pearler midden, which seemed to be the repository for all of the artefactual material, Gavin's Site material was divided into separate industrial and domestic waste areas. Conjoins in the deposit analysed from Gavin's Site Test Pit Two indicate that the stratigraphic layers are intact.

I interpreted linoleum found in the deposit, wood, nails and concrete slab as evidence of the construction of buildings at the site. Corrugated iron found embedded in the ground is thought to be the foundations of a tin shed, possibly used for cleaning the pearl shell. The deposition of domestic rubbish with other building rubble suggests that at least one of the structures was a dwelling place, probably a wooden structure with concrete footings for at least the stove area. Concrete used for stove or hearth areas when the rest of the floor is wooden, is common in the historic period as a safety measure. Floor coverings indicate that the structure had a complete floor of some kind and, if not entirely composed of concrete slab, it may have consisted of wood similar to the houses built in Freshwater Camp/Denham.

The artefactual material uncovered in the deposit at Gavin's Site is a reduced version of that found at The Old Pearler and consists of leather, shell, ceramics, wood, glass,

and metal. The dominant component by weight was the metal category (252.54 g), followed by the ceramics (133.78 g), glass (8.73g) and wood (0.54g). The metal category includes buttons, kitchen refuse such as tin cans and foil, items associated with boats such as copper sheathing and sheathing tacks, and architectural artefacts such as nails and hinges. The ceramic category consists of tableware. Alcohol bottles constitute the bulk of the glass category with some kitchen bottles.

	UNSTRATIFIED	*EXCAVATED*
Ceramics	4	10
Glass	24	19
Wood	0	4
Leather	0	5
Metal	0	35

TABLE ELEVEN: Numbers of fragments of major artefact classes from Gavin's Site.

If the faunal remains from both Gavin's Site Test Pits One and Two are combined, the resulting assemblage is dominated by the invertebrate category (106 326.11g) (see table twelve). The terrestrial faunal remains comprised a comparatively small proportion of the bone category (71.39g) while the marine vertebrates comprised an even smaller proportion (7.61 g). The midden remains contributed 6.88 grams of the marine faunal category and it must be considered that these fish may have been caught by accident in the dredges with the pearlshell, which leaves the fish from kitchen refuse at 0.73 grams. The sheep/goat category by weight constituted 48% of

the terrestrial fauna followed by cattle (42%) and bird (10%). There were no macropod remains found in the deposit at Gavin's Site.

Category	*Weight (grams)*
INVERTEBRATES	106323.56
VERTEBRATES	79
ARTEFACTS	17229.09

TABLE TWELVE: Total weights of finds categories.

SUMMARY OF RESULTS

...historical archaeologists should feel free to roam through whatever territory seems likely to provide solutions to clearly defined archaeological problems (Murray 1983:91).

A summary of the aims of the project will now be discussed in relation to the evidence documented above.

1) **To elucidate the earliest period of the industry.**

Unfortunately material from the earliest period of the pearling industry, that of the 1870s to 1880s, was not uncovered during this study. A detailed view could only be gained by a systematic and extensive excavation of Monkey Mia. That was beyond the scope of this study.

SITE	*MEDIAN DATE*	*DATE RANGE*
UNSTRATIFIED		
The Old Pearler	1901	1850-1926
Wilyah Miah	1908	1906-1910
Heirisson Prong 21	1905	1880-1926
Heirisson Prong 32	1908	1900-1910
Dennis' Site	1941	1941
Useless Loop	1903	1900-1910
Gavin's Site	1913	1900-1941
Raffles Bay	1904	1885-1913
Middle Bluff	1895	1875-1910
Cape Leseur	1899	1885-1910
Herald Bight	1897	1880-1900
EXCAVATED		
The Old Pearler	1897	1880-1910
Gavin's Site TP2	1924	1903-1934

TABLE THIRTEEN: Date ranges of the Shark Bay sites.

The strategy employed to date the sites in the bay involved calculating the range of dates available for each artefact. Only those artefacts that could be dated were included. From this the median date for each artefact was calculated, then these dates

contributed to a range of dates for each site. The median from this range was then presented as the date for the site. Under this conservative system Herald Bight, Middle Bluff and The Old Pearler are the oldest sites. The lack of stratified material may be the reason why the dates are relatively young.

Although no dateable material was taken from Monkey Miah, this site is still considered to have the highest archaeological potential. Monkey Mia and Wilyah Miah both appear quite early in the historical records and I venture that further excavation work at these sites would reveal earlier Aboriginal material.

1) To investigate the visibility of the various ethnic groups that were involved in the industry.

ABORIGINAL LABOURERS

Observation of Aboriginal artefacts in the vicinity of the sites surveyed in 1994 indicates that the camps of the people involved in the industry were located adjacent to but further from the sea than those of the other pearlers. This is consistent with the positioning of other contact sites in Australia where

> ...excavation of two midden sites close to the settlement has shown that the Aborigines remained in close attendance to the settlement (Allen 1973:64).

There is no evidence of any type of structure, although nothing can be concluded from this as structural remains at the pearling middens are limited anyway. The Aboriginal camps include predominantly modified glass fragments, stone artefacts and grindstones. Harrison (1995) included some Shark Bay glass artefacts in his study

of glass artefacts of Western Australia. He concluded that most of the artefacts at the pearling camps were made on bottle bases and that the pearl shell camps formed a source of glass for the Aboriginal people. The bottle sides are presumably in a worked form at sites some distance from the camps. Therefore the Aboriginal camps adjacent to the pearling camps were quarry areas where the bottle bases were reduced and stored (Harrison 1999 pers.comm).

The modified bottle bases collected in the pearling material are all derived from bottles dating to the early twentieth century. Glass was either not adopted for the manufacture of implements before the turn of the century, or the change in the pearl shell fishery at this stage from large camps to domestic units had some effect on the Aboriginal economy and technology. This may be due to the reduction of the Aboriginal people in the labour force. Since non-European people were not permitted to hold leases there may have been wholesale redundancies of people accustomed to living as pearlers for at least half of the year. Alternatively, the down sizing of the camps may have made them more accessible to the Aboriginal people. However, the possibility that the earlier glass implements may simply not have been found during this study cannot be discounted.

ASIAN LABOURERS

The one artefact so far found that can be positively identified as Chinese and dated is the neck of an earthenware jug, which at this stage is tentatively dated to the 1880s. This is significant in that it relates to the period when the Chinese were self employed in the Shark Bay pearling industry. While they may not have seen

themselves as permanent settlers, they probably had, at this stage, the means to procure supplies of their own choosing.

The significance of this is that it was the ability to procure the objects from their home culture, and the intention to return to that culture, that produced its appearance in the record. When the Asian pearlers were settled in the Bay and had presumably mixed to some extent with the local population, there is no distinctive record. This is despite the fact that ethnic divisions were maintained until the recent past. It would appear that Orser's (1995) notion that ethnic groups lose their distinctive cultures when they decide to settle is correct for the Shark Bay story.

This is, of course, in terms of the material record that has survived. According to Von Bamberger (1980) the diet of the Europeans on stations at Shark Bay favoured `mutton, potatoes, carrots and pumpkin' while the Malays retained their traditional food preferences. These traditional food preferences would not have survived the rigours of time in the deposit to tell their story archaeologically although chillies have always been available in Denham (Bowdler pers.comm. 1990) which is an unusual phenomenon in a small Western Australian town. Therefore it is contended that the Asian material culture appeared only when the sojourners were wealthy enough to procure these supplies and that the idea of permanence was irrelevant to the notion of identity. The people that remained in the bay retained the dietary aspect of their material culture but were not in a position, because of the relative poverty of the industry at this stage, to procure other cultural phenomenon.

Perhaps if the sojourners that stayed had become self-employed *and* had an idea of making Western Australia their permanent residence, then they would have dispensed with their traditional culture. Because of the ethnic separation and barriers to social mobility there was no incentive for the pearlers of Asian derivation to adopt the culture of the European pearlers. So in Shark Bay, contrary to studies in other places, the sojourners were wealthier than the settlers. Fish were plentiful and chillies grow well in sandy soil making them cheap, accessible banners of cultural identity for the people that stayed.

Whether there were camps inhabited by one ethnic group only is uncertain. During the clash of 1886 the ethnic groups separated into camps but it cannot be inferred that these camps were in existence at other times. The larger camps with more varied populations had complex arrangements. This can be said with some certainty as these camps are disproportionately represented in the records. The demographic constituents of the smaller camps, however, are still a mystery.

3) To examine the living and working conditions of the pearlers.

Gibbs (1995:318) argues that the intended degree of permanence effects the conduct and settlement of frontier areas. As Shark Bay evolved from a short term seasonal operation based on imported labour to a settlement with a resident population and local labour, this is the perfect area to test the contention that settled populations protect and improve their surroundings;

LIVING CONDITIONS

Analysis of material from the Old Pearler midden site and Gavin's domestic site has revealed sheep bones and pumpkin seeds. These are both present in small numbers, however, and by far the largest component of the diet is suggested by the large proportion of cans contained in the deposit. It is contended that this reliance on imported food in the early period of the industry was precisely because the camps and the industry were regarded as impermanent. Also, the master pearlers involved in the industry were in a position to supply the bay with these stores.

Later, when the industry was operated by small family groups, there was obviously more of an idea of permanence and, because the larger pearling operations and thus the merchants left the Bay when the industry was less profitable, the ability of the pearlers to attain supplies was reduced. According to Jack Fry (OH 2266/8), however, stores arrived from London via Fremantle to Denham through the same agents who sold the stores, for example W.D. Moore and Company, so some degree of reliance on supplies continued into this century.

The biggest surprise was the lack of fish remains in the deposit. The fish remains present are few and so small as to render them hardly worth eating especially when considering the variety and size of fish available in the Bay. As the Shark Bay area accommodates large amounts of large, edible fish and the pearlers were on boats in the water for most of the day with the perfect opportunity to catch the fish, it is incredible that this resource was not exploited to a larger extent.

Some idea of the fish resource developed before the 1930s, however, as it was this knowledge that allowed the fishing industry to develop. It was thus expected that more fish remains would be evident in the middens. Nothing that could be described as edible in size or number was observed at either site. According to Basset (OH 2261/16) during the drought in the depression the locals ate lots of fish including turtle and dugong. Also the young pearl fish could be eaten and were often curried (OH 2261/16). This seems a dangerous proposition considering the cadmium levels present in the soils of the bay.

INDUSTRY

Dredging was the main technique employed in the collection of the shell. Shallow draught boats could work in about 2-3 metres of water, perfect for the shallows of Shark Bay (see plates three and four). These boats were single masted, 25-35 foot cutters, operated by a skipper and one 'deckie' or deck hand (OH 2266/8). The dredges were used on the sandy floor of the bays, about six at a time from the one boat (OH 2266/38), to collect every piece of shell and debris.

> ...their dredges, which are of a triangular shape, somewhat resembling a bell cut through the centre, with an eye at the tapered end to receive the handle. The frame of the dredge is constructed of iron, over which is loosely spread a strong net fastened to a scraper at the bottom. With this the beds are dragged and when the dredge is sufficiently filled with the shell fish, it is hauled into the boat...(Inquirer August 27 1873).

The pearlers would then sort the shells on deck and discard the barnacles and immature shell (OH 2266/38).

Gavin's Site contains evidence of a small corrugated iron shed close to the high tide line. From the picture drawn by witnesses in the Pontivevo murder case in 1883 of Freshwater Camp, it is apparent that these sheds were placed in front of the living quarters(CSO CONS 527 item 1505). Adjacent to each shed is a pogey pot and there are barrels scattered around, presumably for storing water. From this we can infer that the pearlers lived very close to their pearling operations, probably to allow them to protect their shell and equipment(CSO CONS 527 item 1505).

CAMPS

The camps consisted of tents and wooden houses from the earliest recorded instance of the industry. Cooking was performed outside on fireplaces and at Freshwater camp these were adjacent to household wells. According to the historical accounts, camps at other parts of the bay were forced to collect their water from Freshwater Camp and Faure Island, although during the 1994 survey a brackish water soak was identified at Mick's Camp.

Gavin's site in Useless Inlet has a concrete pad, presumably built for the Metters stove. It is inferred that by the twentieth century the pearling camp houses had indoor kitchens and stoves. The laying of concrete suggests some degree of permanence, especially considering that Gavin's Camp is on the eastern side of Heirisson Prong, a long way from the civilised delights of Denham.

4) **To investigate the visibility of the women in the industry.**

In terms of Yentsch's (1991) division between tableware and kitchen categories there is a distinct change from The Old Pearler Site midden to Gavin's Site domestic midden. At Gavin's site there is very little difference between the tableware (21%) and kitchen (29%)categories. At The Old Pearler, however, the kitchen remains are constant at 23% while the table ware remains fall to 3%.

The excavated remains from The Old Pearler are older than those from Gavin's Site. Based on average ages taken from artefacts that could be reliably dated it was estimated that the deposit analysed from the Old Pearler dates to the late nineteenth century while those found in pit two of Gavin's Site appear to derive from the 1920s. From this it is tempting to infer that as the population of women increased in the bay, so did the amount of tableware, making Yentsch's criterion a very effective barometer of gender in Shark Bay.

5) **To describe the evolution of the industry with regard to frontier theory.**

Hardesty's frontier theory is used as a descriptive tool in order to document the change in the bay from extractive industry to settled periphery.

The median dates from the two sites suggest that The Old Pearler (1897) is older than Gavin's Site (1924). It is contended here that these two sites mark the transition from pearling conducted in the nineteenth century under the master pearlers, to the settled pearlers of the late nineteenth and early twentieth centuries. For this reason,

and because little chronological resolution could be inferred from the middens, the sites were each treated as a cultural unit.

The three cultural units used in the artefact analysis were The Old Pearler midden, Gavin's Site midden and Gavin's Site domestic area. As demonstrated in the graph below, the domestic area at Gavin's Site has very little shell while the midden at the same site has minimal artefactual (artificial category) material (see appendix for a list of the midden contents). The Old Pearler, however, has both categories represented. The under representation of personal artefacts in The Old Pearler midden indicates that perhaps these items were discarded closer to the domestic areas. At Gavin's Site it is contended that the two separate disposal areas were deliberate and that there was a definite domestic midden.

This indicates that over time the pearlers changed their rubbish disposal practises, perhaps with some concession to the idea of permanence. Rubbish disposal is a fundamental mark of respect for the immediate environment. The peculiarity is that the Gavin's site domestic arrangement is not far from a large midden which would have served, especially in odorimetric terms, as a suitable repository for garbage. The mind set that dictates that domestic rubbish is domestic and that industrial waste is not, only appears late in the history of the Bay.

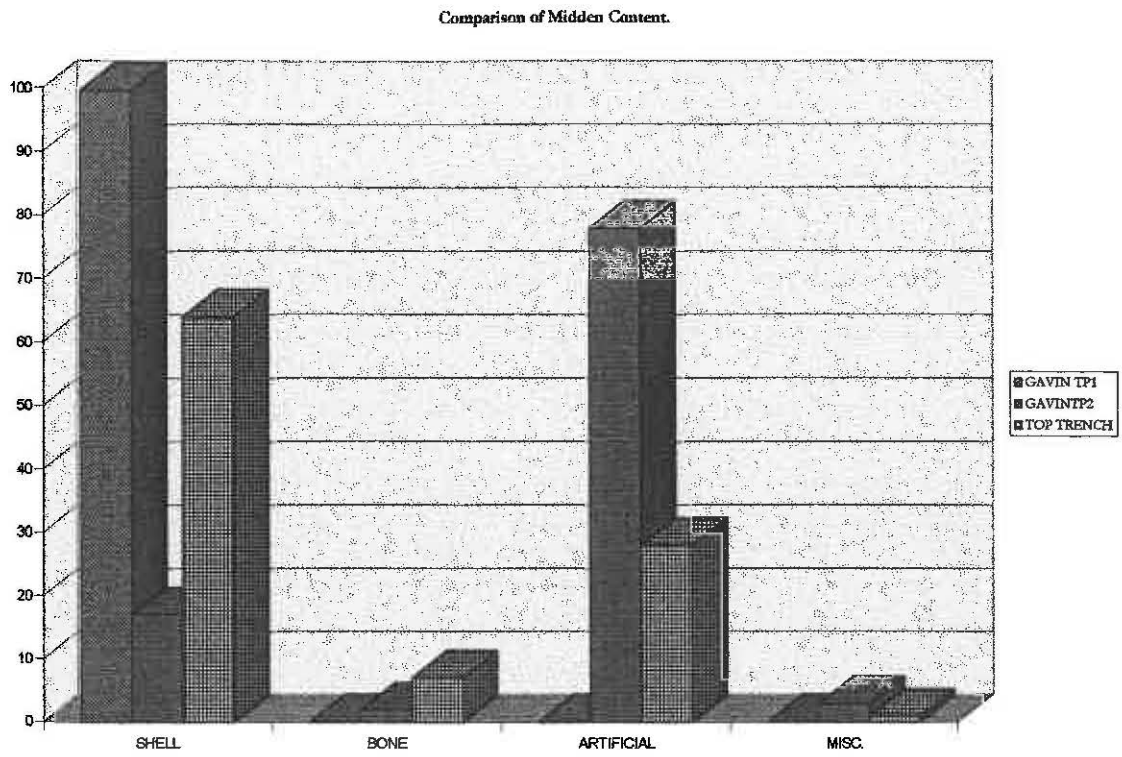


FIGURE THIRTEEN: Summary of midden contents from The Old Pearler Midden (TOP trench), Gavin's Site Midden (Gavin's 1) and Domestic Area (Gavin's 2).

The separation of the industrial sphere from the domestic sphere, at least in ideology, suggests that the pearlers were thinking in terms of Shark Bay constituting a domestic realm as well as merely an industrial area. This indicates a change in ideology from industrial sojourners to settled populace.

In terms of shell size and the sheer amount of non economic shell contained in the middens, it would appear the situation deteriorated over time rather than improved due to government regulation. A Chi test confirmed that the proportion of economic

to non-economic shell at The Old Pearler is significantly different to that at Gavin's Site. Contrary to the deliberate and careful change in rubbish disposal habits at the later site, in terms of industry, the pearlers became less caring of their environment.

The desperation of the pearlers as the industry disintegrated overcame the necessity to preserve the stocks for long term benefit. As there was no future in the industry why not exploit the stocks to the point of depletion? In this stage of the history, industry was supporting settlement rather than the settlement supporting the industry.

The population was trying to survive in an area that could not support the technology they were using. Rather than move, the population used the resources available to them with little thought of conservation for the future. The alternative, fishing for bony fish, presented itself as a viable industry before the settlement died altogether. So, in summary, the notion of permanence effected the pearlers' behaviour to the detriment of their livelihood. This occurred during periods of extreme want in the homeland, however, with the onset of first WW1 (1914-18), then the Great Depression (1929-39), and then WW2 (1939-45).

On the other hand the recycling ethic in the Bay, which is so devastatingly obvious in the structural archaeology, is the positive outcome of the survival tactics of the population. Regardless of what happened, there appeared to be a population which had no intention of leaving. The idea of permanence, however, made them rather more desperate than respectful in terms of their surrounding environment.

In terms of the artefact categories themselves there is a marked shift from an industrially heavy assemblage at the Old Pearler, to a more balanced assemblage at Gavin's Site. This translates, in chronological terms, to a change over time from a frontier type site to a more domestic site. However, it would appear that industrial artefacts are a better indicator of the industrial frontier than architectural remains.

ARTEFACT CATEGORY	***THE OLD PEARLER***	***GAVIN'S SITE***
TABLE WARE	3%	21%
KITCHEN	23%	29%
PERSONAL	4%	2%
CLOTHING	2%	14%
ALCOHOL	15%	8%
MODIFIED	4%	0
FURNITURE	1%	0
ARMS	1%	0
INDUSTRIAL	30%	8%
ARCHITECTURAL	16%	18%

TABLE FOURTEEN: Artefact categories taken from Gavin's Site and The Old Pearler.

The presence of alcohol at Shark Bay does not disappear over time but is reduced by half, lending credence to the legends of the non-abstemiousness of the early frontier.

CONCLUSIONS

The history of the Shark Bay pearling industry is fairly colourful. It was an industry that required a low level of capital investment and as such the investors were not prepared to take any measures to protect their main asset, the pearl shell banks. It was either a quick profit venture or a sideline to some other commercial interest until, when the area was no longer profitable, a remnant population that existed in the bay was dependent on the industry for a livelihood. By then it was too late and the environmental impact on the resource itself was irreversible.

Because the industry depended on labourers, and there was little infrastructure to provide for families, there existed for much of the history of the area a substantial population of bachelor labourers. Because the pay structure was based on race, racism defined the social structure of the area and despite efforts by the authorities to the contrary, violence and inequality pervaded the industry. As McGann (1988) points out, the problem was one of enforcement rather than legislative neglect.

This is echoed in the destruction of the resource. As the initial aim of the industry was to gain a profit to fund other ventures there was little thought for the future of the industry. Similarly there was no high level of capital investment to protect. Later, when the industry was arranged in family groups, the aim was to draw wages in an operation that could no longer support large groups of people. In these terms

dredging the remainder of the shell was the only way to survive and made sense in terms of a short term adaptation. When this was no longer supportable the established population adopted fishing as a means of support. The fish were initially sold to visiting boats but freezing facilities allowed the development of a state wide operation. This fortuitous timing of technology allowed the population to remain in a town that may have become a casualty of progress as have so many Australian ghost towns.

The questions answered about the history of the Shark Bay pearling industry in this study could be augmented by future research. Large scale excavations and salvage work at Monkey Miah and Eastern Bluff would be rewarding. Wilyah Miah is also a large scale camp that remains relatively unscathed by recent human activity and could be excavated in conjunction with research into the possible pre-European contact Aboriginal material at this site.

Although this study attempted to address questions about Aboriginal involvement in the industry it is considered that it would be useful to make a more intensive study of the historic campsites located during the course of these surveys. This would be useful in terms of questions of the impact of European contact and the resulting change in local Aboriginal culture. Furthermore the reaction of the Aboriginal people to the pearling industry has yet to be documented archaeologically.

Gavin's site has the potential to answer further archaeological questions. Although the midden was excavated as a sample of the industrial portion of the site, the shed

foundations remain untouched and may contribute information about the workings of the industry.

It is hoped that in the future this remaining material will be studied to complement the evidence that has been examined and interpreted here. As a tribute to the resourcefulness and unique origins of the people of Shark Bay there is no better record than that of the pearling industry.

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"This was known as the Colonial Secretary's Office until 1924. It functioned from the commencement of the Colony to conduct the correspondence of the Governor with the several departments of the public service and with the public generally. Western Australia ceased to be a Crown Colony in 1890 and from that period onwards separate agencies were gradually formed to deal with the official business of the Government." (Summers et al 1991:54)

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APPENDICES

APPENDIX ONE

ARTEFACT CLASSES AND GROUPS (SOUTH 1985)

CLASS NAME	TYPES
KITCHEN GROUP	1.Ceramics
	2. Wine Bottle
	3.Case Bottle
	4.Tumbler
	5.Pharmaceutical Type Bottle
	6. Glassware
	7. Tableware
	8. Kitchenware
BONE GROUP	9.Bone Fragments
ARCHITECTURAL GROUP	10. Window Glass
	11. Nails
	12. Spikes
	13. Construction Hardware
	14. Door Lock Parts
FURNITURE HARDWARE	15. Furniture Hardware
ARMS GROUP	16. Musket balls, Shot, Sprue
	17. Gunflints, Gunspalls
	18. Gun parts, Bullet Moulds
CLOTHING GROUP	19. Buckles
	20. Thimbles
	21. Buttons
	22. Scissors
	23. Straight Pins
	24. Hook and Eye Fasteners
	25. Bale Seals
	26.Glass Beads
PERSONAL GROUP	27. Coins
	28. Keys
	29. Personal Items
TOBACCO PIPE GROUP	30. Tobacco Pipes
ACTIVITIES GROUP	31. Construction Tools
	32. Farm Tools
	33. Toys
	34. Fishing Gear
	35. Stub-stemmed Pipes
	36. Colono-Indian Pottery
	37. Storage Items
	38. Ethnobotanical
	39. Stable and Barn
	40. Miscellaneous Hardware
	41. Other
	42. Military Objects.

ARTEFACT CLASSES AND GROUPS (South 1985:95-6).

APPENDIX TWO

SITE APPEARANCE IN THE ARCHIVES EXCLUDING THE POLICE OCCURRENCE BOOKS.

	SITES											
Date	Freycinet Harbour	Cape Leseur	Faure Island	Useless Harbour	Wilyah Miah	Dirk Hartog Island	Fresh Water Camp	Egg Island Bay, Trinity & Tetrodon Loop	Monkey Miah	Herald Bight	South Camp	total
1870												0
1871				1								1
1872												0
1873				2								2
1874						1					1	2
1875				1								1
1876			1	1								2
1877												0
1878	1	1	1							1		4
1879												0
1880	1	1		1		1		1				5
1881	1	1		1	1	2		1	1			8
1882					2							2
1883							1					1
1884	3	3										6
1885												0
1886						3						3
1887						2		1				3
1888							3					3
1889												0
1890												0
1891												0

Date	Freycinet Harbour	Cape Leseur	Faure Island	Useless Harbour	Wilyah Miah	Dirk Hartog Island	Fresh Water Camp	Egg Island Bay, Trinity & Tetrodon Loop	Monkey Miah	Herald Bight	South Camp	total
1892					1		1					2
1893												0
1894				1	1				2			4
1895												0
1896				1					1			2
1897				1					1			2
1898							1					1
1899												0
1900				1					1			2
1901												0
1902												0
1903												0
1904												0
1905												0
1906												0
1907												0
1908												0
1909												0
1910									1			1
1911									1			1
1912												0
1913												0
1914												0
1915												0
1916												0

1917												0
Date	Freycinet Harbour	Cape Leseur	Faure Island	Useless Harbour	Wilyah Miah	Dirk Hartog Island	Fresh Water Camp	Egg Island Bay, Trinity & Tetrodon Loop	Monkey Miah	Herald Bight	South Camp	total
1918							1					1
1919												0
1920												0
1921												0
1922												0
1923												0
1924												0
1925												0
1926												0
1927												0
1928												0
1929												0
1930												0
1931												0
1932												0
1933									1			1
total	6	6	2	11	5	9	7	3	9	1	1	

SITES MENTIONED IN THE ARCHIVES EXCLUDING THE POLICE OCCURRENCE BOOKS.

APPENDIX THREE

SITE INFORMATION TAKEN FROM POLICE OCCURRENCE BOOKS

YEAR	CAMP NAME	EUROPEAN PEARLERS	FAMILIES	FOREIGN PEARLERS
1885	cadells cove camp	0		
1885	dirk hartog island			chang vong, von gen, lu vink chow
1885	dolphin pool			small camp of malays
1885	fresh water camp	w.thomas, dalesca		
1885	fry's camp			
1885	mainland's camp			
1885	malay camp			pandac, pandy, jakins, athur
1885	middle camp	fry, l.williams		sacareas
1885	mr brown's camp	middle camp		
1885	smith's camp			ah ping, antoo
1885	south camp	mainland, cross, o'dell, j.holt,graham.bernard,	mrs.mainland	barsiced, saricen, malatip,ally, amat. ibreham, abraham
1885	tundenerra	smith, baliens, barnes,delims	sinmen&wife wained niereu scieurcus	sapone
1885	upper wells camp			
1885	wilyah miah	waspe		alech,gillong
1886	cadells cove camp	barringer		
1886	chinatown			pang kong, ah chee, ah tong, ting po, taima, ah bow, ting sing, kim lah, ah hap, tu walla, sue pan, ah you, ah
1886	chinese camp			
1886	dirk hartog island	hoult, williams, brown		
1886	eagle island camp	williams,		
1886	fresh water camp	durlachers, henfry, thomas, smith	mrs thomas	
1886	fry's camp			ah wee
1886	malay camp			
1886	middle camp	l.&j.willims, cuthbert, j.graham, adams, j.hoult, j.barnard, h.mainland, j.davis, king,		jamie, ah hoy, cpt juan de la cruz, le kim@ah kim, doming bedull, pedro, ah ming, mat, hurrap, madil, domingo,
1886	narkia	thompson, harnett		
1886	notch point			ah wee, ah ling, ah ching

YEAR	CAMP NAME	EUROPEAN PEARLERS	FAMILIES	FOREIGN PEARLERS
1886	old wilgie mia camp	wuopi, dunne, cross		
1886	poland's camp			
1886	police station camp		kitchie(malay female)	william jones,kitchie
1886	rented camp			ah wan@ah koo,esmy, ah chong
1886	south camp	mainland, o'dell, birringer, fry		mat
1886	thompson's camp	poland, thompson, harnett		malay pearlers, anesini
1886	tundenerra	w.l.smith		raimas, chinese pearlers
1886	useless inlet			ah ling
1886	walgogooda	poland brothers, gibbons		malay pearlers
1886	wilyah miah	butcher, waspe		yu kwong, ah long, ah hoy, jong gee
1887	antell harbour	gibbons, john oseline		gorio
1887	brown's anchorage	adams, williams, g.cross		
1887	cape leseur camp	williams, mainland, adams, hoult, graham, cross, j.mcram, w.mack,		prudencio, pandy, pondoon, laffry
1887	dolphin pool	davis		caldron
1887	eagle island camp			
1887	fresh water camp	durlacher, henfry, w.s.smith, cliveland, o'dell, davis, black bros, fry, c.barnard, robins, g.bryar,	mrs o'dell, mrs fry	ahtwee, domingo, mark@magnu
1887	Friday island camp	g.cross		
1887	herald bight	butcher		
1887	lagoon point camp			
1887	middle camp	waspe, nash, berringer, thompson, telford, king bros, adams, williams		ah ping, le andro, caddi rouen, louis, ah hoo, ah wan
1887	monkey mia camp	hoff, hurst		
1887	notch point			
1887	old chinatown	corbett, nichols		caldron
1887	red cliff bay	graham, smith, moore, o'dell, thompson, king, brown, poland		
1887	south camp	berringer,mainland		

YEAR	CAMP NAME	EUROPEAN PEARLERS	FAMILIES	FOREIGN PEARLERS
1887	williams camp			gorio, serillo peralto, simon
1887	wilyah miah	corbett, nichols		suimen
1888	cape leseur camp	adams, williams, mainland, berringer, j.nichols, drummond	eliza healy	ah swan, ah hee, de la cruz, leandro, abdul, ah hee2, ah char, ah chow, ah tuxen, pondock, ah chivan, ah whee,
1888	eagle island camp			
1888	faure island camp			
1888	fresh water camp	e.downham, nash, g.cross	mrs cross	ah koy, domingo, ah samur, ah tin
1888	friday island camp	winner, gibbons, poland		
1888	herald bight	butcher, w.corbett	corbett's daughter	
1888	hestes bank camp	black, henfry, fry		
1888	middle camp	adams, davis, williams, waspe,		pedro, pabian, fianaro de allis, pueblo bastolo, lario, louis rentino, bonifreio
1888	monkey mia camp	o'dell, irwin ho	mrs ho	
1888	notch point	gibbons, john oteline, j.poland		
1888	red cliff bay	graham, broadhurst, w.d.moore&co, smith, o'dell, thompson, poland, durlacher, robins, king, gibson,		ah lee, ah loon
1888	useless harbour	mainland, drummond, adams, corbett, surejohn, j.edwards		pandock, hassin, ah ping, ah char, sappie, ah hee, sam, cordian, siren,
1888	wilyah miah			chinese
1889	cape leseur camp	w.henrietta, g.cross, j.adams, l.williams, h.mainland, c.berenger, j.w.nichols, s.e.leiler, w.gibbons, j.leary, h.emerson, e.w.butcher,	mrs nelson, mrs.williams, mrs.mainland&3daughters, adams family, nichols 2 children	a malay boatman, sinclair's chinamen, leandre, 2 malays, 2 manillamen, 3 malays
1889	chinatown	lambert, peterson		
1889	dirk hartog island	capt.henfry		
1889	fresh water camp	durlacher, a.scott, j.barnard, g.cross, capt.knight, f.smith, williams	g.cross family	ah sam
1889	Friday island camp	w.e.skinner, e.j.skinner	mrs.skinner, skinner family	2 malays

YEAR	CAMP NAME	EUROPEAN PEARLERS	FAMILIES	FOREIGN PEARLERS
1889	herald bight	tunn?	mrs.tunn?	2 chinamen
1889	hestes bank camp	s.fry, a.henfry, p.peterson, a.thomas	mrs.henfry, mrs.fry	malays
1889	monkey mia camp	j.thompson, e.w.brown, a.scott, w.watson, w.ashworth, j.robins, j.graham, w.king, w.smith, w.sweeney, h.o'dell, w.lumpton, a.fry, broadhurst, f.robins, deene, o'grady,	mrs.king, mrs.lumpton&4children, mrs broadhurst, mrs smith&4 children, mrs o'dell&2children, mrs thompson&niece	2 coloured men, 2 malays, assam, adgee
1889	red cliff bay	a.fry, telford, g.wear, broadhurst		malays, pandy, ahmat, ah gee
1889	thompson's camp	thompson		
1889	tundenerra	c.thompson, w.j.cleveland		2 chinese
1889	wilyah miah	w.henrietta, j.learey, h.emerson, w.smith, j.poland, c.waggoner, e.winder, capt.monroe, poland	mrs.smith, mrs robins	chinese, a malay, jaffa, malays
1889	yankee town	j.mccann, w.mac, g&j.casey	mrs.smith,	
1890	fresh water camp	h.barnard, g.brown, g.fry		
1890	wilyah miah	w.smith, c.lambert, j.adams. j.headland, peterson, e.willis, f.monroe, k.thyrell?, j.oseline, a.fry, j.mccann, e.winder, c.&g.casey,	mrs.smith	a mallay, a coloured, 2 coloured men, 2 ab natives
1890	cape leseur camp	l.williams, j.adams, j.headland, f.w.nichols, mitchell, h.mainland, a.wilson, harnebrock?, strickland,	mrs.williams, adams family	2 coloured men, a malay, 2 coloured men
1890	herald bight	e.w.butcher,j.d.&w.sweeney		
1890	monkey mia camp	j.nelson, w.d.moore, h.daws, w.j.stokes, g.anham, n.stephens,w.gibbons, p.willis,	mrs o'dell&2children	2 malays, 1afghan
1890	hestes bank camp	h.fry	mrs.h.fry, missj.fry, miss.shelmadine	2 malays, 2 coloured men
1890	Friday island camp	t.dentin, j.petersen		4 coloured men
1890	lagoon point camp	g.gknight	missbutcher	1 coloured man
1890	tundenerra	f.cleveland		6 cooley labourers
1890	dirk hartog island	w.d.moore junr, a.fry, h.stephens, t.panlem		

YEAR	CAMP NAME	EUROPEAN PEARLERS	FAMILIES	FOREIGN PEARLERS
1890	middle bluff camp			
1890	lagoon point camp	e.w.butcher, dr.leffan, g.g.knight		
1890	eagle bluff	j.s.durlacher		
1891	Friday island camp	j.black		2 coloured men
1891	fresh water camp	j.mckenna, f.monroe, l.meekham		3 asiatics, 4 coloured men
1891	lagoon point camp	e.w.butcher, l.o'grady, f.bloomquish, l.gerrard, s.ponten, n.c.jones	miss butcher	2 malays
1891	monkey mia camp	a.fry, w.d.moore, t.broadhurst, j.robins, a.henfry, e.thompson,	mrs nelson&child	
1891	cape leseur camp	e.willis, w.atkins, williams, w.hoult	mrs williams	a coloured man, 2 asiatics, 2 malays
1891	wiyah miah	j.o'grady, h.o'grady, r.kennedy		
1891	dirk hartog island	j.smith, w.sweeney, eliot, j.mckenna,	mrs smith	4 coloured men
1891	tundenerra	whelan		
1891	thompson's camp			

MASTER PEARLERS	FOREIGN LABOUR	ABORIGINAL LABOUR	PEARL BANKS	STORES
		jonny baliawa, wanga@georgie		
	la ah lu			
graham	1 malay(graham),			
ting sing				
		wanga@georgey,strawberry	cape leseur banks	
		georgie		

MASTER PEARLERS	FOREIGN LABOUR	ABORIGINAL LABOUR	PEARL BANKS	STORES
		mala@sandy, wondoo@mickey		
		gilla(f), neurighy(f), keeny(f), gilba(f), george		

MASTER PEARLERS	FOREIGN LABOUR	ABORIGINAL LABOUR	PEARL BANKS	STORES
abdoola				
		coal tar		
		billy barney, wanga@georgy, wunnoo@charly, winga, wangi@jenry		
e.w.butcher, j.williams, j.sinclair	a portugese antone martin	a native, champion		
durlacher, g.cross		champion, g.cross reports an ab. woman in his employ missing. aboriginal mia on the hill.		barnard's pearlers rest inn

MASTER PEARLERS	FOREIGN LABOUR	ABORIGINAL LABOUR	PEARL BANKS	STORES
henfry				
j.graham	a japanese labourer	magpie, billy barney, cassie, wanga@georgy, tara@filla, william henry		w.d.moore's
telford	a malay for mrtelford			
thompson				
		ab. boatsman		
		filla		
		2 ab. native, billy barney&a boy		
f.w.nichols				
		ab.native		
cleveland				

MASTER PEARLERS	FOREIGN LABOUR	ABORIGINAL LABOUR	PEARL BANKS	STORES
		native miahs		
seedon				

BUILDINGS	EVENTS	BOATS	COMMENTS
			aboriginal camp situated some distance back from this camp
			mentioned because chinese were doing pearling activities and ran a pearling show with ting sing as employer. ah luk died. november 1886 all but 5 houses moved to notch point.
			same as chinatown?
			until further notice. chinese and european camps between
			thomas lost overboard
			temporary police station
			antell harbour?
			cuthbert died of dysentary, ah ming died of dysentary
			notch point until new headquarters erected at freshwater

BUILDINGS	EVENTS	BOATS	COMMENTS
			near thompson's?
			near police station
			rented from fry of useless loop since mid november 1885
			antill harbour, asenini died
			may not be a camp
			listed as gibbons camp also
			all pearlers at cape leseur except williams (see monkey mia) shifting camp to heirrison prong, useless inlet, october 1887.
			listed as davis camp also.
			mr fry married miss phoebe shellmardine
			freycinet inlet
			alias butcher's camp
			deserted may 1887
			first mentioned in november

BUILDINGS	EVENTS	BOATS	COMMENTS
			listed as wilgie mia
			cape leseur was a place where the pearlers meet incoming boats, so people listed were not necessarily residing at the camp; I have tried to overcome overlap if pearlers are
painting, sofa - galvanised iron house			'catha gonda'. opium purchased from incoming boat without
			heirrison peninisula
			pedro and waspe perished in a knife brawl. middle bluff pearling grounds used september 1888.
			flinders at dirk hartog island. monger&co sheep station at
			old natives camp near here.
			listed as both corbetts camp and old chinatown.
j.williams premises			3 chinamen departed. meet the ss australind here from singapore. meet ss flinders. meet ss dolphin. meet ss otway.pearl banks between here and f.w.c. may1889. boxing day regatta. meet ss franklin.
			walking distance - between wilyah miah and yankee town.
			ss australind. meet ss flinders. brown's anchorage.
small tin house belonging to ah sam and other chinamen			pearlers' meeting at pearlers' rest inn: e.w.butcher, j.graham, f.w.nichols, j.adams, l.williams, s.e.leiler, e.skinner, r.fry, a.henfry, capt.knight. yacht club meeting. october 1889
			heirrison peninsula

BUILDINGS	EVENTS	BOATS	COMMENTS
mr&mrs.tunns' house and effects			
			s.w. of freycinet estuary
			magpie died. wool from tamala shipped from here to london on board 'kingdom of saxony'
			up the inlet from yankee town, (Pallaburabura).
frank@mrs.smiths' house and effects			meet s.s. flinders here.
		blanche, haulters, janet, vixen, alice,	lincoln arrives here. police court before e.w.butcher.j.p.
		cutter helene, cutter minnie	
		cutter sunbeam	meet ss franklin, ss otway, ss australind here.
			w.d.moores cutter peron proceeding to carnarvon with passengers. schooner nellie arrives here. malay pandy taking mails to monkey miah on horse back. investigating sly grog
		cutter edith	
			rations, january. noradin,virfa,pira-tamby,pakis-
		lily blanche, peram?, cutter leo	moore, fry, stephens&panlem intend pearling near the south.....january. meet the cutter helena here.

BUILDINGS	EVENTS	BOATS	COMMENTS
		cutter casacutter, cutter helena	
		cutter little eastern?	for fremantle
		cutter victory, cutter blanche	a malay, seedon, in the employ of mr butcher, did commit an unnatural..... on a female goat and was caught in the act by
		cutter blanche	schooner nellie
		blanche,	
		cutter neena?	
		helena, cutter arthur george, cutter	ss australind lands here

APPENDIX FOUR

EXCAVATED AND UNSTRATIFIED ARTEFACTS

artefact #	date range	type	artefact class	description	conjoin	median date
top-us-1	0	ceramic	table ware	blue transfer		0
top-us-2	0	ceramic	table ware	blue transfer	top-us-4 & 22	b
top-us-3	1900	1940 ceramic	table ware	hotel ware		1920
top-us-4	0	ceramic	table ware	blue transfer	top-us-2 & 22	0
top-us-5	0	ceramic	table ware	blue transfer		0
top-us-6	1900	1920 ceramic	table ware	hotel ware		1910
top-us-7	1900	1920 ceramic	table ware	hotel ware		1910
top-us-8	1900	1920 ceramic	table ware	hotel ware		1910
top-us-9	0	ceramic	table ware	blue transfer		0
top-us-10	0	ceramic	table ware	blue transfer		0
top-us-11	1900	1920 glass	kitchen	pharmaceutical-bottle neck		1910
top-us-12	1900	glass	kitchen	sauce bottle-complete		1900
top-us-13	0	metal	miscellaneous	bell shaped piece		0
top-us-14	1840	1880 ceramic	personal	pipe stem		1860
top-us-15	1900	1920 glass	alcohol	clear bottle with stopper		1910
top-us-16	1866	1940 metal	kitchen	sardine tin		1903
top-us-17	1850	1930 glass	kitchen	bottle neck		1890
top-us-18	0	shell	activities	cut pearlshell		0
top-us-19	1890	1900 glass	kitchen	".owell mass.usa"		1895
top-us-20	0	glass	alcohol	"to the gallo…"		0
top-us-et-1	0	ceramic	alcohol	george skey/tamworth /wilnecote		0

artefact #	date range		type	artefact class	description	conjoin	median date
top-us-et-2	0		ceramic	alcohol	20 fragments of above		0
top-us-sr-1	0		ceramic	kitchen	large jug		0
top-us-sr-2	1850		glass	alcohol	black glass bottle		1850
top-np-1	0		glass	kitchen	clear bottle base		0
top-us-sr-3	1913	1940	glass	kitchen	maconochie lowestoft		1926.5
top-us-sr-4	0		nd				0
top-us-sr-5	1900	1920	ceramic	table ware	hotel ware, serving dish		1910
top-us-sr-6	1900	1920	ceramic	table ware	hotel ware, saucer		1910
top-us-sr-7	1840	1880	ceramic	personal	pipe bowl fragment		1860
top-us-sr-8	0		ceramic	table ware	teacup base		0
top-us-sr-9	1860	1940	glass	kitchen	hockin london		1900
top-us-sr-10	1913	1940	glass	kitchen	maconochie		1926.5
top-us-sr-11	0		glass		amethyst glass fragment		0
top-us-sr-12	1913	1940	glass	kitchen	maconochie lowestoft		1926.5
top-us-21	1900		glass	alcohol	sabre'd neck		1900
top-us-22	0		ceramic	table ware	blue transfer	top-us-4 & 2	0
top-us-23	0		glass	alcohol	black bottle fragment		0
top-us-24	1850	1880	ceramic	personal	pipe bowl - face form		1865
top-us-et-3	1900		ceramic	kitchen	earthenware vessel		1900
top-us-et-4	1900		ceramic	kitchen	earthenware vessel		1900
top-us-et-5	0		ceramic	kitchen	earthenware vessel		0
top-us-et-6	0		ceramic	kitchen	earthenware vessel		0
top-us-et-7	1900	1920	glass	alcohol	green bottle		1910
top-us-et-8	1880		glass	kitchen	clear bottle small		1880

artefact #	date range	type	artefact class	description	conjoin	median date
top-us-et-9	1860	1890 ceramic	kitchen	earthenware vessel		1875
top-us-et-10	1900	1940 ceramic	table ware	blue transfer		1920
top-us-c-1	0	metal	alcohol	lead capsule		0
top-us-c-2	1900	1920 glass	alcohol	bottle neck & capsule		1910
top-us-c-3	1900	1912 glass		bottle base		1906
top-us-c-4	0	glass	kitchen	pharmaceutical-bottle		0
top-us-c-5	0	ceramic	table ware	teacup base		0
top-us-c-6	1900	1920 glass		clear bottle base		1910
top-us-c-7	1883	1940 ceramic	table ware	lilac transfer saucer		1911.5
top-us-c-8	0	ceramic	table ware	blue transfer		0
top-us-c-9	0	metal	arms group	cartridge		0
top-us-c-10	1900	1920 glass	alcohol	green bottle		1910
top-us-c-11	1900	1920 glass	kitchen	pharmaceutical		1910
top-us-c-12	0	glass	table ware	amethyst pressed glass		0
top-us-c-13	0	metal	alcohol	wire bottle tie		0
					median date	1901.0606

THE OLD PEARLER: Unstratified Artefacts.

artefact #	date range		type	artefact class	description	conjoin	median date
wm-us-1	1900	1912	glass	kitchen	clear bottle base		1906
	1900	1912	glass	kitchen	clear bottle base		1906
wm-us-2	0	0	glass	modified	retouched clear base		0
wm-us-3	0	0	glass	modified	retouched green base		0
wm-us-4	0	0	glass	modified	green base core - 11 flake scars		0
wm-us-5	0	0	glass	modified	retouched green base >4 scars.		0
wm-us-6	0	0	glass	modified	8 flakes		0
wm-us-7	0	0	stone	modified	silcrete flake		0
wm-us-8	0	0	ceramics	tableware	lilac transfer teacup/bowl fragment		0
wm-us-9	1900	1920	glass	modified	black base core		1910
wm-us-10	1900	1920	glass	modified	green base 1/2 core - 8 flake scars		1910
wm-us-11	0	0	glass	modified	retouched green bottle side		0
wm-us-12	0	0	glass	modified	black base core >10 flake scars		0
wm-us-13	0	0	glass	modified	green glass flake		0
wm-us-14	0	0	glass	modified	dark glass flake		0
wm-us-15	0	0	glass	modified	green glass flake		0
wm-us-16	0	0	ceramics	personal	pipe stem decorated		0
wm-us-17	0	0	metal	architectural	copper sheathing tack		0

wm-us-18	0	0	metal	clothing	button - mcdonald&walter	0
wm-us-19	1900	1920	glass	alcohol	reiss&brady bordeaux	1910
					median	1908.4

artefact #	date range	type	artefact class	description	conjoin	median date
np-us-1	0	0 ceramic	personal	pipe stem - plain		0
np-us-2	0	0 metal	clothing	button -our own make		0
						#NUM!
cc-us-1	0	0 ceramic	tableware	blue transfer	top-us-et-10	0
cc-us-2	0	0 glass		3 fragments		0
cc-us-3	0	0 metal		4 pieces corroded metal		0
						#NUM!
hp-21-1	1880	ceramic	kitchen	chinese jug fragment		1880
hp-21-2	0	0 ceramic	tableware	saucer- lilac paint&embossing		0
hp-21-3	1900	glass	modified	possible flake removal		1900
hp-21-4	1900	1920 glass	alcohol	green glass bottle		1910
hp-21-5	0	0 ceramic	tableware	brown transfer - staffordshire knot?		0
hp-21-6	1900	1920 ceramic	tableware	hotelware - blue		1910
hp-21-7	0	0 ceramic	tableware	jug handle - green transfer		0
	0	0 ceramic	tableware	green transfer jug		0
hp-21-8	0	0 ceramic	tableware	blue flow - cola…..		0
hp-21-9	0	0 ceramic	tableware	black transfer, rhij…, bees and flowers.		0
hp-21-10	0	0 ceramic	tableware	plate fragment - "enamel, porcelain?"		0

artefact #	date range		type	artefact class	description	conjoin	median date
hp-21-11	0	0	glass		blue glass jar lid - internal screw		0
hp-21-12	0	0	glass	tableware	lamp or vase neck		0
	0	0	glass	kitchen	mauve glass bottle base		0
hp-21-13	0	0	glass	modified	black base core > 5		0
hp-21-14	0	0	glass	modified	black base core		0
hp-21-15	0	0	glass	modified	6 green glass fragments		0
hp-21-16	0	0	metal	architectural	nailed sheet		0
hp-21-17	1923	1930	glass	kitchen	agm 11		1926.5
hp-21-18	0	0	ceramic	tableware	blue transfer	top-us-et-1	0
hp-21-19	0	0	glass	kitchen	cobalt blue bottle neck		0
						median	**1905.3**
hp-32-1	1900	1920	glass	alcohol	green glass bottle		1910
hp-32-2	1900	1900	glass	alcohol	green glass bottle		1900
hp-32-3	1900	1920	glass	alcohol	brown bottle base		1910
hp-32-4	0	0	glass	alcohol	brown bottle neck		0
hp-32-5	0	0	ceramic	tableware	bowl - green transfer		0
hp-32-6	1900	1920	ceramic	tableware	hotelware - red		1910
hp-32-7	1900	1920	ceramic	tableware	hotelware - blue		1910
						median	**1908**
ds-us-1	0		metal	clothing	copper buckle or embellishment		0
ds-us-2	0		metal		filigree		0

artefact #	date range	type	artefact class	description	conjoin	median date
ds-us-3	1934	1948 glass	kitchen	pharmaceutical vc greatheads mixture		1941
ds-us-4	0	0 glass		3 green glass fragments		0
					median	**1941**
ui-us-1	0	0 ceramic	tableware	blue transfer - bowl		0
ui-us-2	0	0 ceramic	tableware	brown transfer saucer	top-us-c-8	0
ui-us-3	0	0 ceramic	tableware	blue transfer fragment	top-us-4	0
						0
ul-us-1	1900	1920 ceramic	tableware	hotel ware blue jug or mug		1910
ul-us-2	1880	1920 glass	alcohol	green bottle - base		1900
ul-us-3	1880	1920 glass	alcohol	green bottle - neck		1900
ul-us-4	0	glass	alcohol	798 on base		0
ul-us-5	0	metal	clothing	buckle?		0
					median	**1903.3333**
mbp-us-1	0	glass	kitchen	clear bottle fluted body		0
mbp-us-2	0	ceramic	tableware	chinese?		0
						0

NOTCH POINT, COSY CORNER, HEIRRISSON PRONG, DENNIS' SITE, USELESS INLET 2, USELESS LOOP AND MANGROVE BAY: Unstratified Artefacts.

artefact #	date range	type	artefact class	description	conjoin	median date
gs-us-1	1923 1930	glass	kitchen	agm 7	hp-21-17	1926.5
gs-us-2	0 0	glass	alcohol	clear glass		0
gs-us-3	1900 1920	ceramic	tableware	hotelware - blue		1910
gs-us-4	1900	glass	alcohol	green glass champagne seal		1900
gs-us-5	1900 1920	glass	alcohol	brown glass bottle		1910
gs-us-6	1900 1920	glass	alcohol	green glass bottle base		1910
gs-us-7	1900	glass	alcohol	green glass bottle champagne		1900
gs-us-8	0 0	glass		clear bottle side		0
gs-us-9	1900 1920	glass	alcohol	green bottle neck		1910
gs-us-10	0 0	ceramic	kitchen	earthenware jug fragment		0
gs-us-11	1900	glass	alcohol	green bottle fragment		1900
gs-us-12	1900	glass	alcohol	green bottle fragment		1900
gs-us-13	0 0	glass	kitchen	clear glass jar		0
gs-us-14	1920 1930	glass	kitchen	blue bottle - property of the perth glass works		1925
gs-us-15	0 0	glass		opaque glass jar - fluted body - external screw		0
gs-us-16	0 0	ceramic	kitchen	plate or saucer fragment - alfred meakin england		0
gs-us-17	0 0	ceramic	tableware	bowl, scalloped, embossed		0
gs-us-18	1923 1930	glass	kitchen		hp-21-17	1926.5
gs-us-19	0	glass	kitchen	williams&sons, alphing....victoria a.....		0

gs-us-20	1900	1920	glass	kitchen	clear glass bottle embossed	1910
gs-us-21	0		glass		clear bottle ..ne….	0
gs-us-22	0		glass		green glass ….c…..	0
gs-us-23	0		glass		water rolled green glass	0
gs-us-24	0		glass		green fragment embossed	0
gs-us-25	0		glass		green fragment embossed	0
gs-us-26	0		glass		2 x clear fragments	0
gs-us-27	1934	1948	glass	kitchen	brown glass jar	1941
gs-us-28	1923		glass	alcohol	brown glass bottle	1923
					median	**1913.7143**

GAVIN'S SITE: Unstratified Artefacts.

artefact #	date range		type	artefact class	description	conjoin	median date
rb-us-1	0	0	ceramic	tableware	white bowl fragment		0
rb-us-2	0	0	ceramic	tableware	jug or mug fragment		0
rb-us-3	0	0	glass		white opaque glass		0
rb-us-4	0	0	ceramic	tableware	bowl base		0
rb-us-5	0	0	ceramic	kitchen	earthenware fragment		0
rb-us-6	0	0	ceramic	tableware	saucer - marine damage		0
rb-us-7	1900	1920	ceramic	tableware	red hotelware		1910
rb-us-8	0	0	ceramic	tableware	blue, brown, white bowl or cup		0
rb-us-9	0	0	glass	kitchen	blue bottle base		0
rb-us-10	1890	1920	glass	kitchen	c.hockin london		1905
rb-us-11	1890	1920	glass	kitchen	pharmaceutical		1905
rb-us-12	1870	1900	ceramic	tableware	plate- royal garter, f.primavesi&sons, london, swansea&newport, mon.		1885
rb-us-13	0	0	ceramic	kitchen	earthenware fragment - salt damaged		0
rb-us-14	0	0	ceramic	tableware	plate - lion symbol, ...ramique, mab...fricht		0
rb-us-15	0	0	ceramic	kitchen	burnt jug or bottle base		0
rb-us-16	1913		glass	kitchen	...estoft		1913
rb-us-17	0	0	ceramic	kitchen	earthenware fragment		0

artefact #	date range		type	artefact class	description	conjoin	median date
rb-us-18	0	0	ceramic	tableware	blue transfer, scalloped edge, salt damaged		0
bb-us-1	1900	1920	glass	kitchen	clear glass jar		1910
bb-us-2	1900	1912	glass	kitchen	clear glass jar - m		1906
bb-us-3	0		ceramic	kitchen	earthenware jug fragment		0
						median	**1904.8571**

RAFFLES BAY AND BOTTLE BAY: Unstratified Artefacts.

artefact #	date range		type	artefact class	description	conjoin	median date
mb-us-1	1860	1890	glass	alcohol	tooled neck bottle		1875
mb-us-2	0		glass	alcohol	986 stamped on base		0
mb-us-3	0		glass		clear glass bottle base		0
mb-us-4	1860	1890	glass	alcohol	green glass bottle		1875
mb-us-5	0		glass	alcohol	clear glass bottle base		0
mb-us-6	0		ceramic	personal	pipe stem ben nevis		0
mb-us-7	1900	1920	glass	alcohol	green glass bottle		1910
mb-us-8	0		ceramic	tableware	plate fragment black transfer Asiatic Pl.....P.B.&C..... on back		0
mb-us-9	0		ceramic	tableware	blue transfer white stoneware mug		0
mb-us-10	0		ceramic	kitchen	jar neck 4 stamped on rim	top-us-et-4	0
mb-us-11	0		ceramic	tableware	red transfer jug or mug fragment		0
mb-us-12	1880	1900	ceramic	tableware	green transfer saucer garter festoon	hp-1-21-7	1890
mb-us-13	0		metal	clothing	shoe heel		0
mb-us-14	0		ceramic	tableware	green transfer mug or jug fragment	mb-us-12	0
mb-us-15	0		ceramic	tableware	lilac transfer plate transfer		0
mb-us-16	0		ceramic	tableware	blue transfer mug or jug rope&flower motif	mb-us-10	0
mb-us-17	0		ceramic	tableware	mug or jug fragment butterflys&flowers		0
mb-us-18	1900	1920	ceramic	tableware	large bowl fragment red hotel ware		1910
ms-us-19	1900	1920	ceramic	tableware	plate fragment blue hotel ware		1910

artefact #	date range		type	artefact class	description	conjoin	median date
mb-us-20	0		ceramic	tableware	blue transfer plate frag. bird&flower		0
mb-us-21	0		ceramic	tableware	green transfer mug or jug fragment	mb-us-12	0
mb-us-22	0		metal	industrial	perforated weight		0
						median date	**1895**
cl4-us-1	1870	1900	glass	alcohol	gin/rum bottle		1885
cl4-us-2	1870	1900	glass	alcohol	gin/rum bottle		1885
cl4-us-3	0		metal	industrial	dredging basket		0
cl4-us-4	1890	1905	glass	personal	amethyst octagonal bottle fragment		1897.5
cl4-us-5	1880	1920	glass	alcohol	green glass bottle		1900
cl4-us-6	1900	1920	glass	alcohol	green bottle base		1910
cl4-us-7	0		ceramic	kitchen	earthen ware fragment		0
cl4-us-8	0		ceramic	tableware	blue flow transfer with lilac, cup or jug, key design		0
cl4-us-9	0		ceramic	tableware	blue transfer saucer		0
cl4-us-10	0		ceramic	tableware	white teacup base with gold motif		0
cl4-us-11	1900	1920	ceramic	tableware	blue hotel ware teacup fragment		1910
cl4-us-12	0		ceramic		white stoneware fragment raised green letters		0
cl4-us-13	1900	1920	ceramic	tableware	red hotel ware saucer		1910
						median date	**1899.6429**
cl2-us-1	0		ceramic	kitchen	earthen ware fragment		0

artefact #	date range		type	artefact class	description	conjoin	median date
cl2-us-2	0		ceramic	kitchen	earthen ware fragment - green glaze		0
cl2-us-3	0		ceramic	tableware	saucer fragments	hp-21-2	0
cl2-us-4	0		ceramic	tableware	stoneware eggcup gold line decoration		0
cl2-us-5	0		ceramic	tableware	teacup fragment	top-us-9	0
cl2-us-6	0		ceramic	tableware	blue transfer rim fragment		0
cl2-us-7	0		ceramic	tableware	brown transfer plate fragment		0
cl2-us-8	0		ceramic	tableware	blue transfer plate fragment staff...	regd	0
cl2-us-9	0		ceramic	tableware	cup fragment	top-us-c-8	0
cl2-us-10	0		ceramic	tableware	large bowl fragment brown transfer	top-us-5	0
cl2-us-11	0		metal	industrial	metal cable 15mm		0
							0
hb-us-1	1860	1900	glass	alcohol	black glass bottle neck with cork		1880
hb-us-2	1890	1905	glass	personal	amethyst bottle neck		1897.5
hb-us-3	0		glass	kitchen	cobalt blue pharmaceutical		0
hb-us-4	1900	1920	glass		this bottle is the property felton grimwade melbourne		1910
hb-us-5	0		glass	kitchen	davis vegetable painkiller		0
hb-us-6	0		glass	kitchen	vinegar bottle		0
hb-us-7	1880	1920	glass	alcohol	clear glass bottle		1900
hb-us-8	0		glass	kitchen	clear glass bottle		0
hb-us-9	1880	1920	glass	alcohol	green glass bottle neck		1900
hb-us-10	1880	1920	glass	alcohol	green glass bottle neck		1900

artefact #	date range	type	artefact class	description	conjoin	median date
hb-us-11	0	glass		clear glass bottle fragment		0
hb-us-12	0	glass		clear glass bottle base - melted		0
hb-us-13	0	glass	modified	black glass base >4 flake scars		0
hb-us-14	0	metal	clothing	button brass? military		0
hb-us-15	0	metal	industrial	copper flange		0
					median date	**1897.9167**

MIDDLE BLUFF, CAPE LESEUR AND HERALD BIGHT: Unstratified Artefacts.

artefact #	date range		type	artefact class	description	conjoin	median date
top-1-4-01	0	0	metal	architectural	nails eroded x 9		0
top-1-4-02	0		metal	clothing	button		0
top-1-4-03	1870	1920	metal	alcohol	lead capsule leadenhall		1895
top-1-4-04	0		metal	industry	copper - boat fixture		0
top-1-5-01	0		metal	industry	copper - boat fixture		0
top-1-5-02	0		metal	industry	copper - boat fixture		0
top-1-5-03	0		metal	architectural	nails eroded x 4		0
top-1-6-01	0		metal	personal	tobacco tin		0
top-1-6-02	0		metal	architectural	nails eroded x 16		0
top-1-7-01	0		metal	architectural	nails eroded x 5		0
top-1-8-01	0		metal	architectural	nails eroded x 2		0
top-1-9--1	0		metal	architectural	nails eroded x 4		0
top-1-cew-1	0		metal	industry	copper sheathing tack		0
top-2-2-01	0		ceramic	tableware	blue transfer - white stoneware		0
top-2-2-02	0		ceramic	tableware	blue transfer		0
top-2-2-03	1900		ceramic	tableware	pink, green and brown teapot fragment		1900
top-2-2-04	0		metal	clothing	shoe eyelets		0
top-2-3-01	0		metal	architectural	nails eroded x 20		0
top-2-3-02	0		metal	kitchen	tin can lid		0
top-2-3-03	0		metal	industry	copper pieces		0

artefact #	date range	type	artefact class	description	conjoin	median date
top-2-3-04	0	metal	industry	copper sheathing		0
top-2-3-05	0	metal	clothing	suspender button		0
top-2-3-06	0	metal	clothing	our own make button		0
top-2-3-07	0	metal	industry	washer		0
top-2-3-08	0	metal	industry	copper tack		0
top-2-3-09	0	metal	arms	cartridge		0
top-2-3-10	0	metal	architectural	nails eroded x 25		0
top-2-4-01	1890	shell	clothing	pearlshell button		1890
top-2-4-02	0	metal	industry	copper nail		0
top-2-4-03	0	metal	clothing	dietz & co.london button		0
top-2-4-04	0	metal	architectural	nails eroded x 12		0
top-2-4-05	0	metal	kitchen	tin can lid		0
top-2-5-01	0	metal		tubular metal circle		0
top-2-5-02	0	metal	industry	copper		0
top-2-5-03	0	metal	architectural	nails eroded x 4		0
top-2-6-01	0	wood	clothing	wooden button 4 drill flat		0
top-2-6-02	0	metal	architectural	nails eroded x 15		0
top-2-7-01	0	metal	architectural	nails eroded x 3		0
top-3-1-01	1880	1920 glass	alcohol	turn mould bottle neck		1900
top-3-1-02	0	metal	clothing	shoe eyelets		0
top-3-1-03	0	metal	architectural	nails eroded x 9		0

artefact #	date range		type	artefact class	description	conjoin	median date
top-3-1-04	0		leather	clothing	shoe		0
top-3-1-05	0		metal		metal strap - barrel?		0
top-3-2-01	0		metal	industry	copper		0
top-3-2-02	0		metal	clothing	hook of hook&eye		0
top-3-2-03	0		metal	industry	copper nail		0
top-3-2-04	0		metal	industry	copper		0
top-3-2-05	0		metal		metal plug		0
top-3-2-06	0		metal	architectural	nails eroded x 42		0
top-3-2-07	0		metal	alcohol	lead capsule		0
top-3-2-08	0		stone	modified	quartzite flake fragment		0
top-3-3-01	0		metal	industry	copper nails x 4		0
top-3-3-02	0		metal	industry	copper		0
top-3-3-03	0		metal	clothing	our own brand button		0
top-3-3-04	0		metal	architectural	nails eroded x 4		0
top-3-3-05	0		metal		metal cable		0
top-3-3-06	1866	1930	metal	kitchen	tin can key		1898
top-3-3-07	0		metal	kitchen	tin can lid		0
top-3-3-08	0		metal	alcohol	lead capsule ..on..man..hole		0
top-3-4-01	0		ceramic	kitchen	earthenware fragment		0
top-3-4-02	0		metal	architectural	nails eroded		0
top-3-4-03	0		metal		metal disc eroded		0
top-3-5-01	0		metal	industry	copper nails x 2		0
top-3-5-02	0		metal	industry	copper		0

artefact #	date range		type	artefact class	description	conjoin	median date
top-3-5-03	0		metal .	architectural	nails eroded		0
top-3-5-04	0		ceramic	kitchen	red glazed earthenware		0
top-3-6-01	0		ceramic	personal	toothpaste jar fragment		0
top-3-6-02	0		metal	industry	copper		0
top-3-6-03	0		metal	clothing	eyelet		0
top-3-6-04	0		metal	architectural	nails eroded		0
top-3-6-05	0		metal	architectural	bolts		0
top-3-7-01	0		metal	clothing	eyelet		0
top-3-7-02	0		metal	industry	copper tack		0
top-3-7-03	0		glass	modified	flake		0
top-3-7-04	0		glass	modified	flake with over hang removal		0
top-3-7-05	0		stone	modified	calcrete flake		0
top-3-7-06	0		metal	architectural	nails eroded		0
top-3-7-07	0		metal		zinc diecast		0
top-3-7-08	0		metal	alcohol	lead capsule		0
top-3-8-01	0		metal	alcohol	lead capsule fragment		0
top-3-9-01	0		metal	alcohol	lead capsule fragment		0
top-3-ins	1880	1920	glass	alcohol	bottle base		1900
top-3-ww	1880	1920	glass	alcohol	bottle neck		1900
top-4-0-01	0		leather	clothing	shoe		0
top-4-1-01	1866	1930	metal	kitchen	tin can key x 2		1898
top-4-1-02	0		bone	kitchen	mutton - ribs, pelvis limbs		0

artefact #	date range		type	artefact class	description	conjoin	median date
top-4-1-03	0		ceramic	kitchen	earthenware fragment		0
top-4-5-01	0		metal	clothing	cloth covered button		0
top-4-5-01	0		bone	kitchen	mutton		0
top-4-5-02	0		metal	clothing	" but shanked		0
top-4-5-04	0		metal	clothing	buckle - army issue?		0
top-4-5-05	0		metal	industry	copper nail		0
top-4-7-01	0		botanical	kitchen	pumpkin seed		0
top-4-7-02	0		ceramic	personal	pipe stem tip		0
top-4-7-03	0		ceramic	clothing	white button - opaque glass?	top-5-3-1	0
top-4-7-04	0		leather	clothing	shoe		0
top-4-7-05	0		metal	kitchen	lead capsule		0
top-5-1-01	0		rubber				0
top-5-1-02	0		metal	architectural	nails eroded		0
top-5-1-03	0		metal		cable		0
top-5-1-04	0		metal		spring		0
top-5-1-05	0		metal	industry	copper nail		0
top-5-1-06	0		metal	industry	copper		0
top-5-1-07	1880		glass	alcohol	bottle neck		1880
top-5-1-08	1880	1920	glass	alcohol	bottle neck		1900
top-5-1-09	0		glass	architectural	plate glass clear		0
top-5-2-01	1900	1920	glass	kitchen	clear bottle mo…..		1910
top-5-2-02	0		metal	industry	copper tack		0
top-5-2-03	0		metal	industry	copper tack		0

artefact #	date range		type	artefact class	description	conjoin	median date
top-5-2-04	0		metal	architectural	nails eroded x 15		0
top-5-2-05	0		metal	industry	copper sheathing		0
top-5-2-06	0		metal	activities	harmonica piece		0
top-5-3-01	0		ceramic	clothing	white button - opaque glass?		0
top-5-3-02	0		metal	industry	copper tack		0
top-5-5-01	0		ceramic	kitchen	terracotta glazed earthen ware fragment		0
top-5-5-02	1866	1930	metal	kitchen	tin can key		1898
top-5-7-01	0		metal	alcohol	lead capsule		0
top-6-1-01	0		bone	kitchen	mutton limb		0
top-6-2-01	0		bone	kitchen	mutton limb & jaw		0
top-6-2-02	0		metal	industry	copper tacks x 5		0
top-6-2-03	0		ceramic	personal	pipe - davidson glasgow		0
top-6-2-04	0		glass	kitchen	clear glass bottle/jar neck		0
top-6-3-01	1880	1920	glass	alcohol	green turn mould		1900
top-6-3-02	0		metal	industry	copper tack		0
top-6-3-03	0		metal	furniture	upholstery tack		0
top-6-3-04	0		botanical	kitchen	6 pumpkin seeds		0
top-6-3-05	1890		shell	clothing	pearlshell button		1890
top-6-4-01	0		ceramic	kitchen	earthenware fragment	top-5-5-1	0
top-6-4-02	0		metal	alcohol	lead capsule fragment		0
top-6-4-03	0		glass	architectural	window glass		0

artefact #	date range	type	artefact class	description	conjoin	median date
top-6-4-04	0	metal	industry	copper sheathing		0
top-6-4-05	0	bone	kitchen	mutton ribs		0
top-6-5-01	0	metal	alcohol	lead capsule fragment		0
top-6-5-02	0	metal	industry	copper nail		0
top-6-5-03	0	botanical	kitchen	4 pumpkin seeds		0
top-6-5-04	0	bone	kitchen	mutton ribs		0
top-6-6-01	0	metal	industry	copper nails x 3		0
top-6-6-02	0		clothing	burnt button - wood or bone		0
top-6-6-03	0	metal	alcohol	lead capsule fragment		0
top-6-7-01	0	metal	alcohol	lead capsule fragment		0
top-6-7-02	0	ceramic	clothing	white button - opaque glass?	top-5-3-1 & top-5-5-1	0
top-6-7-03	0	metal	industry	copper nail		0
					median date	1897.0714

artefact #	date range	type	artefact class	description	conjoin	median date
gs-2-01-1	0	ceramic	tableware	plate fragment	gs-us-17	0
gs-2-01-2	0	glass	kitchen	sauce bottle		0
gs-2-01-3	0	metal	industrial	copper		0
gs-2-01-4	0	metal	industrial	nail		0
gs-2-01-5	0	metal	architectural	nails eroded		0
gs-2-02-1	0	glass	kitchen	clear bottle/jar fragment		0
gs-2-02-2	0	glass	alcohol	brown glass inscribed with …ed		0
gs-2-02-3	0	glass	kitchen	brown glass inscribed with …ji..snt…..zcewltd.		0
gs-2-02-4	0	glass	kitchen	clear bottle/jar fragment		0
gs-2-03-1	0	ceramic	tableware	white stoneware	gs-2-1-1 & gs-us-17	0
gs-2-03-2	0	plastic	architectural	linoleum - weave pattern on back		0
gs-2-04-1	1903	1940 glass	kitchen	clear bottle/jar fragment		1921.5
gs-2-05-1	0	leather	clothing	boot		0
gs-2-05-2	1920	1940 glass	alcohol	brown crown seal bottle		1930
gs-2-06-1	0	metal	kitchen	tin can lid		0
gs-2-06-2	0	metal	industrial	boat rigging		0
gs-2-06-3	0	metal	architectural	hinge - cabinet		0
gs-2-07-1	0	plastic	architectural	linoleum - weave pattern on back	gs-2-3-2	0
gs-2-07-2	0	metal	industrial	nail x 2		0

artefact #	date range		type	artefact class	description	conjoin	median date
gs-2-07-3	0		metal	clothing	5 eyelets shoe		0
gs-2-07-4	0		leather	clothing	boot sole		0
gs-2-07-5	1920	1940	glass	alcohol	brown crown seal bottle		1930
gs-2-07-6	1929	1933	glass	alcohol	brown bottle base agm		1931
gs-2-07-7	1929	1940	glass	alcohol	green bottle - table…brewed…mait…and…conte…uid…c printed onto glass		1934.5
gs-2-07-8	0		glass	kitchen	clear bottle ...lea vs printed on side		0
gs-2-08-1	0		plastic	architectural	linoleum - weave pattern on back	gs-2-3-2 & gs-2-7-1	0
gs-2-08-2	0		metal	kitchen	foil		0
gs-2-09-1	0		leather	clothing	shoe		0
gs-2-09-2	0		metal	industrial	nail		0
gs-2-09-3	0		metal	architectural	nail eroded		0
gs-2-10-1	1904	1940	metal	kitchen	tin can		1922
gs-2-10-2	0		glass	kitchen	bottle base		0
gs-2-10-3	0		chalk	personal	cobalt blue pigment		0
gs-2-10-4	0		fabric	clothing	black shirt fabric machine sewn		0
gs-2-11-1	0		glass	kitchen	bottle stopper		0
gs-2-11-2	0		wood		cork		0
gs-2-11-3	0		ceramic	tableware	plate fragment		0
gs-2-11-4	0		metal	architectural	large nail		0
gs-2-12-1	0		ceramic	tableware	porcelain saucer		0
gs-2-12-2	0		leather	clothing			0

artefact #	date range		type	artefact class	description	conjoin	median date
gs-2-12-3	0		botanical	kitchen	pumpkin seed		0
gs-2-13-1	0		leather	clothing	shoe instep		0
gs-2-13-2	0		leather	clothing	shoe		0
gs-2-13-3	0		wood		cork		0
gs-2-13-4	0		ceramic	tableware	egg cup		0
gs-2-14-1	0		metal		copper lid on wood - chair leg?		0
gs-2-14-2	0		ceramic	tableware	white stoneware		0
gs-2-14-3	0		wood		fragments with green/cream paint		0
gs-2-14-4	0		wood		cork		0
gs-2-14-5	0		metal	architectural	nail fragments		0
gs-2-14-6	1866	1940	metal	kitchen	tin can key		1903
gs-2-14-7	0		metal	industrial	copper washer		0
gs-2-15-1	0		ceramic	tableware	white stoneware saucer		0
gs-2-17-1	0		metal	kitchen	lead capsule - pink a…e		0
gs-2-17-2	0		glass	tableware	etched glass - lamp or glass		0
gs-2-17-3	0		metal	architectural	nail eroded x 4		0
gs-2-18-1	0		glass	tableware	etched glass - lamp or glass	gs-2-17-2	0
gs-2-18-2	0		ceramic	tableware	stoneware fragments x 2		0
gs-2-18-3	0		metal	architectural	corroded nail		0
gs-2-18-4	0		glass	kitchen	clear glass bottle base		0
gs-2-19-1	0		metal	architectural	nails eroded x 2		0
gs-2-19-2	0		glass	tableware	etched glass - lamp or glass	gs-2-17-2 & gs-2-18-1	0
gs-2-19-3	0		ceramic	tableware	white stoneware		0

artefact #	date range	type	artefact class	description	conjoin	median date
gs-2-19-4	0	ceramic	tableware	plate fragment		0
gs-2-20-1	0	metal	kitchen	tin can lid		0
gs-2-21-1	0	glass		this bottle is the property of dyason's popy ltd. printed on glass		0
gs-2-21-2	0	glass	tableware	incised glass	gs-2-17-2 & gs-2-18-1 & gs-2-19-2	0
gs-2-21-3	0	metal	architectural	nail eroded		0
gs-2-22-1	0	metal	kitchen	tin can		0
gs-2-22-2	0	metal	kitchen	tin can with illegible paper label		0
gs-2-22-3	0	metal	kitchen	tin can lid		0
					median date	1924.5714

APPENDIX FIVE

EXCAVATED MATERIAL FROM GAVIN'S SITE AND THE OLD PEARLER

MARIINE REMAINS											
pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*economic sub total*	*total*	*LOCATION*
388.29		63.94	47.41				78.98	3.93	499.64	582.55	TOP-1-0
614.22	3.82	90	106.95	0.78		11.64	197.34	41.61	827.41	1066.36	TOP-1-1
							0.01	0.18	0	0.19	TOP-1-10
				0.22	0.24		0.01		0.46	0.47	TOP-1-11
787.56		65.71	236.97	3.18		8	212.94	0.1	1101.42	1314.46	TOP-1-2
1431.45	1.01	245.13	499.39	265.85	0.16	0.34	315.28	4.45	2443.33	2763.06	TOP-1-3
450.48		60.14	254.55	2.01			104.08		767.18	871.26	TOP-1-4
1215.1		205.42	333.82	4.63	0.72		332.41		1759.69	2092.1	TOP-1-4-B
1665.58	**0**	**265.56**	**588.37**	**6.64**	**0.72**	**0**	**436.49**	**0**	**2526.87**	**2963.36**	**TOP -1-4-T**
793.14	7.71	156.27	344.84	4.88			303.03		1306.84	1609.87	TOP-1-5
1242.7	4.8	183.41	234.88	2.4			242.08		1668.19	1910.27	TOP-1-5-B
1117.6		218.63	437.98	205			317.95	0.26	1979.21	2297.42	TOP-1-5-C
3153.44	**12.51**	**558.31**	**1017.7**	**212.28**	**0**	**0**	**863.06**	**0.26**	**4954.24**	**5817.56**	**TOP-1-5-T**
840.18		174.29	361.71	5.11					1381.29	1381.29	TOP-1-6
202.17	7.54	22.97	12.99	1.55			44.25		247.22	291.47	TOP-1-6-A
1774	0.57	208.51	270.52	3.34			273.33	3	2256.94	2533.27	TOP-1-6-B
1411.25	7.44	272.57	447.84	1.35		5.95	253.97		2146.4	2400.37	TOP-1-6-C
1646.1	9.23	144.75	266.82	8.99		4.44	322.5	1.35	2080.33	2404.18	TOP-1-6-D
5873.7	**24.78**	**823.09**	**1359.88**	**20.34**	**0**	**10.39**	**894.05**	**4.35**	**8112.18**	**9010.58**	**TOP-1-6-T**
5.2	4.93	69.59	270.73	1.44	0.14	1.58	53.12	0.11	353.61	406.84	TOP-1-7
21.59	9.91	39.48	312.63	1.46	0.52	0.51	19.99	0.18	386.1	406.27	TOP-1-8
7.01	19.45	8.66	192.79	1.85	4.62	0	16.4		234.38	250.78	TOP-1-9
									0	0	TOP-1-CEW
			14.23						14.23	14.23	TOP-1-WS
2.77		18.39	4.52			1.36	2.98		27.04	30.02	TOP-2-0
3.26		20.32	69.99	0.71		7.86	0.83	1.22	102.14	104.19	TOP-2-02
13.99	10.23	1.87	93.36	1.17		47.52	2.85	1.59	168.14	172.58	TOP-2-03
22.35	14.87	18.05	190.32	3.24	0.02	12.41	1.81	4.4	261.26	267.47	TOP-2-04

TOP

pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*economic sub total*	*total*	*LOCATION*
11.5	11.46	6.47	161.73	4.84	0.36	1.68	1.56	0.34	198.04	199.94	TOP-2-05
0.23			9.3	0.3	0.5	0.84	0.87		11.17	12.04	TOP-2-06
							0.41		0	0.41	TOP-2-07
									0	0	TOP-2-3D
0.64			2.36	0.4		11.59	0.25		14.99	15.24	TOP-3-01
1.47	1.37	5.42	13.95	0.35	0.56	19.58	0.42	0.84	42.7	43.96	TOP-3-02
34.55	1.23	6.97	20.93	1.35	1.73	0.58	2.41	5.29	67.34	75.04	TOP-3-03
					0.13				0.13	0.13	TOP-3-03-CLE.
29.42	7.44	4.22	6.42	1.75	0.84		0.39	1.21	50.09	51.69	TOP-3-04
0.57			11.22	0.44	0.14		1.74		12.37	14.11	TOP-3-05
6.11					1.36			0.9	7.47	8.37	TOP-3-6
0.45	5.69	1.05	10.85		2.82	9.02	0.58	1.9	29.88	32.36	TOP-3-7
									0	0	TOP-3-7-CW
							0.01		0	0.01	TOP-3-8
0.03							0.05		0.03	0.08	TOP-3-9
							0.01		0	0.01	TOP-3-CWW
76.3	14.2	17.12	8.9				1.96		116.52	118.48	TOP-4-0
1.75			16.5			7.14			25.39	25.39	TOP-4-1
0.88	8.95	4.16	0.59	0.17		7.74	2.61	0.09	22.49	25.19	TOP-4-1-B
1.62	1.33			0.72	0.15		0.48		3.82	4.3	TOP-4-5
									0	0	TOP-4-6-2-D
			8.8		3.45		0.49		12.25	12.74	TOP-4-7
0.78					0.08				0.86	0.86	TOP-4-8
3.64			0.58						4.22	4.22	TOP-5-0
11.08			4.47	1.46		0.57	1.97	2.33	17.58	21.88	TOP-5-1
7.17		12.74	1.63	0.09	0.48	0.1	20.49	0.45	22.21	43.15	TOP-5-2
			9.7	0.2			4.26		9.9	14.16	TOP-5-3
70.52			25.2	1.83	0.9		3.69		98.45	102.14	TOP-5-4
13.98			11.61	1.19	1.12	0.39	7.2		28.29	35.49	TOP-5-5

TOP

pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*economic sub total*	*total*	*LOCATION*
		0.03			0.48	0.2	2.63		0.71	3.34	TOP-5-6
									0	0	TOP-5-7
									0	0	TOP-5-8
0.18			0.33	0.28	0.29	0.28	0.07		1.36	1.43	TOP-6-1
2.54				0.1	0.25		5.14		2.89	8.03	TOP-6-2
33.53		17.61	2.79	2.85	1.47		12.46	3.34	58.25	74.05	TOP-6-3
8.94			2.46	1.93	1.53		0.15	5.39	14.86	20.4	TOP-6-4
5.45	1.08		0.97	0.04	1.48	0.99		0.55	10.01	10.56	TOP-6-5
					0.89	0.67		0.91	1.56	2.47	TOP-6-6
0.03							0.14	0.29	0.03	0.46	TOP-6-7
14313.77	**154.26**	**2363.89**	**5336.53**	**539.45**	**27.43**	**162.98**	**3168.58**	**86.21**	**22898.31**	**26153.1**	

						TERRESTRIAL									
fisby bone	*fisby crania*	*fisby scales*	*otolith*	*marine mammal*	*total*	*sheep/goat*	*cattle*	*bird*	*macropod*	*non diagnostic mammal*	*other*	*non diagnostic bone*	*burnt bone*	*total*	*LOCATION*
					0	11.39								11.39	TOP-1-0
1.34	0				1.44						4.2			4.2	TOP-1-1
0.99					0.99						0.75			0.75	TOP-1-10
0.51					0.51									0	TOP-1-11
9.06	0		0.07		9.13							11.53		11.5	TOP-1-2
10.08					10.08							0.31		0.31	TOP-1-3
0.14					0.14						4.22			4.22	TOP-1-4
1.27					1.27									0	TOP-1-4-B
1.41	**0**	**0**	**0**	**0**	**1.41**	**0**	**0**	**0**	**0**	**0**	**4.22**	**0**	**0**	**4.22**	**TOP -1-4-T**
0.09					0.09									0	TOP-1-5
0.55					0.55									0	TOP-1-5-B
0.76					0.76									0	TOP-1-5-C
1.4	**0**	**0**	**0**	**0**	**1.4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**TOP-1-5-T**
0.41					0.41				5.14					5.14	TOP-1-6
0.18					0.18						1.15			1.15	TOP-1-6-A
4.55					4.55						39.76			39.76	TOP-1-6-B
1.38					1.38						4.17			4.17	TOP-1-6-C
2.21			0.06		2.27	0.44					0.82			1.26	TOP-1-6-D
8.73	**0**	**0**	**0.06**	**0**	**8.79**	**0.44**	**0**	**0**	**5.14**	**0**	**45.9**	**0**	**0**	**51.48**	**TOP-1-6-T**
1.55					1.55				0.68			1.92		2.6	TOP-1-7
6.77					6.77		1.04				7.91			8.95	TOP-1-8
7.07					7.07							18.33		18.33	TOP-1-9
0.01					0.01									0	TOP-1-CEW
					0							1.23		1.23	TOP-1-WS
					0			0.3						0.3	TOP-2-0
52.34					52.34						0.13			0.13	TOP-2-02
4.55			0.18		4.73		2.96				14.81			17.77	TOP-2-03
22.91			0.12		23.03	19.74			0.95	44.83				65.52	TOP-2-04

fishy bone	fishy crania	fishy scales	otolith	marine mammal	total	sheep/goat	cattle	bird	marapod	non diagnostic mammal	other	non diagnostic bone	burnt bone	total	LOCATION
16.54	0.69		0.1		17.33				3.64	41.16				44.8	TOP-2-05
38.02					38.02							10.86	0.97	11.83	TOP-2-06
1.68					1.68					0.07				0.07	TOP-2-07
					0	37.27								37.27	TOP-2-3D
1.1					1.1					21.92	0.36			22.28	TOP-3-01
39.51	0.24				39.75					34.35			1.21	35.56	TOP-3-02
92.97	0		0.38		93.35	93.17			0.85		0	283.19		377.21	TOP-3-03
2.54					2.54		15.3		0.75					16.05	TOP-3-03-CLE
36.29	0.1				36.39	72.19						100.02		172.21	TOP-3-04
17.11	0		0.08		17.19							12.8		12.8	TOP-3-05
22.42	0		0.21		22.63							0.44		0.44	TOP-3-6
26.13	8.25	0.41	0.02		34.81							20.46	0.87	21.33	TOP-3-7
0.3		0.03			0.33									0	TOP-3-7-CW
7	0.91	0.04	0.07		8.02							0.1		0.1	TOP-3-8
2.25		0.03			2.28									0	TOP-3-9
4.04					4.04									0	TOP-3-CWW
					0						16.85	0.77		17.62	TOP-4-0
0.36					0.36							3		3	TOP-4-1
10.2	0.24	0.01	0.03		10.48					59.22	1.23	2.5	0.2	63.15	TOP-4-1-B
26.39	2.72	0.02			29.13	99.39			4.04	97.18	0.83	4.81	97.09	303.34	TOP-4-5
0.13					0.13							0.76		0.76	TOP-4-6-2-D
23.57	3.23	0.15	0.08		27.03					18.93	0.77	0.67	4.37	24.74	TOP-4-7
2.99	4.75	0.01			7.75					1.79		0.19		1.98	TOP-4-8
0.18					0.18							3.5		3.5	TOP-5-0
25.67					25.67	2.98		1.42				57.84		62.24	TOP-5-1
17.48	0.05	0.01			17.54						30.96	20.17		51.13	TOP-5-2
7.54	0.24				7.78				0.94		11.16	9.58	0.09	21.77	TOP-5-3
12.23	2	1.61	0.01		15.85					20.19				20.19	TOP-5-4
16.41	1.58				17.99					4.77		1.56		6.33	TOP-5-5

TOP

fishy bone	fishy crania	fishy scales	otolith	marine mammal	total	sheep/goat	cattle	bird	maropod	non diagnostic mammal	other	non diagnostic bone	burnt bone	total	LOCATION
8.83	0.3	0.21			9.34							0.71		0.71	TOP-5-6
1.87	0.04	0.09			2						1.39			1.39	TOP-5-7
0.03					0.03									0	TOP-5-8
1.54	0.03		0.06		1.63					29.04		3.25		32.29	TOP-6-1
23.08	0.8				23.88	68.05			0.68	32.94		14		115.67	TOP-6-2
68.86	1.06	0.08		9.49	79.49					72.32		8.8		81.12	TOP-6-3
42.25	6.05	0.17			48.47				1.46	86.12				87.58	TOP-6-4
17.69	0.96	0.14			18.79					20.66		6.67	2.57	29.9	TOP-6-5
13.89		0.77			14.66					13.72	0.21	5.78	0.33	20.04	TOP-6-6
4.26		0.08			4.34	0.38				0.43		1.4	2.53	4.74	TOP-6-7
762.07	**34.24**	**3.86**	**1.47**	**9.49**	**811.23**	**405**	**19.3**	**1.72**	**19.13**	**599.64**	**141.68**	**607.15**	**110.23**	**1903.82**	

THE OLD PEARLER

TOP

ARTIFICIAL														
diagnostic glass	*modified/ artefactual glass*	*non diagnostic bottle glass*	*total*	*metal wires*	*copper*	*other metal*	*non diagnostic metal*	*total*	*domestic ceramic*	*industrial ceramic*	*structural ceramic*	*modified ceramic*	*total*	*LOCATION*
32.96			32.96				57.68	57.68					0	TOP-1-0
		49.51	49.51			3.63	332.92	336.55					0	TOP-1-1
		0.02	0.02	41.34			1.44	42.78					0	TOP-1-10
			0					0					0	TOP-1-11
		0.3	0.3			6.98	96.8	103.78					0	TOP-1-2
		0.04	0.04	66.26			7.87	74.13					0	TOP-1-3
0.39			0.39			3.26	12.33	15.59					0	TOP-1-4
			0			3.66	24.3	27.96					0	TOP-1-4-B
0.39	**0**	**0**	**0.39**	**0**	**0**	**6.92**	**36.63**	**43.55**	**0**	**0**	**0**	**0**	**0**	**TOP -1-4-T**
0.88		0.12	1			5.11	14.75	19.86					0	TOP-1-5
0.41			0.41			15.43	3.25	18.68					0	TOP-1-5-B
		2.3	2.3			0	13.14	13.14					0	TOP-1-5-C
1.29	**0**	**2.42**	**3.71**	**0**	**0**	**20.54**	**31.14**	**51.68**	**0**	**0**	**0**	**0**	**0**	**TOP-1-5-T**
0.16			0.16			20.46		20.46					0	TOP-1-6
0.35			0.35			1.49	1.07	2.56					0	TOP-1-6-A
1.53			1.53			10.16	6.32	16.48					0	TOP-1-6-B
2.12			2.12			58.53	1.15	59.68		6.34			6.34	TOP-1-6-C
		0.06	0.06	2.47			1.23	3.7	0.14				0.14	TOP-1-6-D
4.16	**0**	**0.06**	**4.22**	**2.47**	**0**	**90.64**	**9.77**	**102.88**	**0.14**	**6.34**	**0**	**0**	**6.48**	**TOP-1-6-T**
		15.18	15.18			3.18	0.2	3.38					0	TOP-1-7
1.91			1.91	0.55			11.91	12.46					0	TOP-1-8
0		0.56	0.56			12.42	0.69	13.11					0	TOP-1-9
			0	0.99			1.52	2.51					0	TOP-1-CEW
			0	5.61				5.61					0	TOP-1-WS
			0	8.07				8.07					0	TOP-2-0
		41.89	41.89	1.65		0.45	395.12	397.22	31.9				31.9	TOP-2-02
		42.33	42.33	13.32	6.97	47.44	315.65	383.38					0	TOP-2-03
		26.4	26.4	9.08		8.51	18.91	36.5					0	TOP-2-04

TOP

diagnostic glass	modified/ artefactual glass	non diagnostic bottle glass	total	metal wires	copper	other metal	non diagnostic metal	total	domestic ceramic	industrial ceramic	structural ceramic	modified ceramic	total	LOCATION
		6.44	6.44	6.24	0.36	3.32	3.56	13.48					0	TOP-2-05
		2.34	2.34	41.89			27.96	69.85					0	TOP-2-06
			0	0.78			0.91	1.69					0	TOP-2-07
			0					0					0	TOP-2-3D
7.4		5.14	12.54	10.91		12.1	492.6	515.61					0	TOP-3-01
		89.3	89.3	13.4	2.32	19.46	1224.4	1259.5					0	TOP-3-02
342.82			342.82	115.25	13.45	100.74	434.56	664			128.96		128.96	TOP-3-03
		0.91	0.91	1.87			16.17	18.04					0	TOP-3-03-CLE
12.78			12.78	9.86		12.68	48.27	70.81	2.98				2.98	TOP-3-04
		3.37	3.37	4.21	1.47		23.42	29.1	0.22				0.22	TOP-3-05
			0	4.02	1.26	16	36.82	58.1	0.3				0.3	TOP-3-6
	0.32	5.26	5.58	19.98	0.69	66.26	46.47	133.4				1.23	1.23	TOP-3-7
			0					0					0	TOP-3-7-CW
2.24			2.24	2.81		0.14	6.35	9.3					0	TOP-3-8
			0	0.29		0.14	2.71	3.14					0	TOP-3-9
		11.09	11.09				14.28	14.28					0	TOP-3-CWW
21.6			21.6	1.1		4.73	34.24	40.07					0	TOP-4-0
			0	1.1			118.17	119.27					0	TOP-4-1
7.31		83.45	90.76	66.11	3	6.32	1193.6	1269	0.31				0.31	TOP-4-1-B
		85.79	85.79	67.36	5.21	13.19	28.15	113.91	33.88				33.88	TOP-4-5
			0			363.13		363.13					0	TOP-4-6-2-D
0.21		5.92	6.13	18.42		1.15	3.55	23.12	0.55				0.55	TOP-4-7
		1.91	1.91					0					0	TOP-4-8
11.26			11.26				4.03	4.03					0	TOP-5-0
208.53			208.53			26.75	490.76	517.51					0	TOP-5-1
43.4			43.4	51.99		37.4	40.45	129.84					0	TOP-5-2
59.37			59.37	53.25	0.77		0.82	54.84	0.58		257.45		258.03	TOP-5-3
66.6			66.6	3.65			1.9	5.55					0	TOP-5-4
16.77			16.77			3.78	10.92	14.7	0.86				0.86	TOP-5-5

TOP

natural plant material	*artefactual plant material*	*charcoal*	*landsnail*	*insect*	*residue*	*total*	*TOTAL*	*LOCATION*
0.1		0.22			18.75	19.07	301.06	TOP-2-05
0.26	0.4	0.04	0.09		23.66	24.45	158.53	TOP-2-06
					1.65	1.65	5.5	TOP-2-07
					11.28	11.28	48.55	TOP-2-3D
1.5				0.02	52.1	53.62	620.39	TOP-3-01
3.7		0.05			210.08	213.83	1681.93	TOP-3-02
2.7	0.26	0.85			190.42	194.23	1875.61	TOP-3-03
0.08					7.39	7.47	45.14	TOP-3-03-CLE.
0.58	.04	0.01			71.24	71.83	418.69	TOP-3-04
2.45	0.02	0.01			17.36	19.84	96.63	TOP-3-05
0.63		0.08			15.82	16.53	106.37	TOP-3-6
0.01		0.14	0.01		19.36	19.52	248.23	TOP-3-7
						0	0.33	TOP-3-7-CW
0.01		0.01			8.59	8.61	28.28	TOP-3-8
0.03					2.06	2.09	7.59	TOP-3-9
0.01					4.98	4.99	34.41	TOP-3-CWW
2.48					15.81	18.29	216.06	TOP-4-0
0.21		0.01			48.92	49.14	197.16	TOP-4-1
2.99					86.02	89.01	1547.93	TOP-4-1-B
0.58		0.04			73.32	73.94	644.29	TOP-4-5
					220.18	220.18	584.2	TOP-4-6-2-D
1.2	0.04	0.05			21.28	22.57	116.88	TOP-4-7
0.02	0		0.13		1.48	1.63	14.13	TOP-4-8
0.36					0.9	1.26	24.45	TOP-5-0
0.26	0.27				59.76	60.29	896.12	TOP-5-1
0.33	0.06				70.3	70.69	355.75	TOP-5-2
0.11					9.32	9.43	425.38	TOP-5-3
0.52					15.33	15.85	226.18	TOP-5-4
1.57					20.07	21.64	113.78	TOP-5-5

MISCELLANEOUS								
natural plant material	*artefactual plant material*	*charcoal*	*landsnail*	*insect*	*residue*	*total*	*TOTAL*	*LOCATION*
0.95		0.8			74.51	76.26	760.84	TOP-1-0
38.52		6.03	0.44		213.71	258.7	1716.76	TOP-1-1
			0.01		3.19	3.2	47.93	TOP-1-10
NEG					0.45	0.45	1.43	TOP-1-11
39.21		13.66	2.41		383.73	439.01	1878.18	TOP-1-2
18.48		8.68			797.52	824.68	3672.3	TOP-1-3
3.17		1.23	0.27	0.03	305.08	309.78	1201.38	TOP-1-4
6.19		2.67			438.85	447.71	2569.04	TOP-1-4-B
9.36	**0**	**3.9**	**0.27**	**0.03**	**743.93**	**757.49**	**3770.42**	**TOP -1-4-T**
8.86		1.29			574.22	584.37	2215.19	TOP-1-5
10.87		1.3			602.92	615.09	2545	TOP-1-5-B
2.43		1.38			657.34	661.15	2974.77	TOP-1-5-C
22.16	**0**	**3.97**	**0**	**0**	**1834.48**	**1860.61**	**7734.96**	**TOP-1-5-T**
0.81		1.37			670.86	673.04	2080.5	TOP-1-6
12.16		1.5			112.39	126.05	421.76	TOP-1-6-A
119		204			698.74	1021.74	3617.33	TOP-1-6-B
0.71		1.65	0		656.17	658.53	3132.59	TOP-1-6-C
9.34		1.94			647.48	658.76	3070.37	TOP-1-6-D
142.02	**0**	**210.46**	**0**	**0**	**2785.64**	**3138.12**	**12322.55**	**TOP-1-6-T**
1.01					50.34	51.35	480.9	TOP-1-7
3.2					39.12	42.32	478.68	TOP-1-8
0.43		0.15		0.37	125.02	125.97	415.82	TOP-1-9
0.09						0.09	2.61	TOP-1-CEW
						0	21.07	TOP-1-WS
					6.2	6.2	44.59	TOP-2-0
2.18				NEG	82.62	84.8	712.47	TOP-2-02
2.16		0.11		0.03	278.34	280.64	901.43	TOP-2-03
2.84					27.73	30.57	449.49	TOP-2-04

TOP

diagnostic glass	modified/ artefactual glass	non diagnostic bottle glass	total	metal wires	copper	other metal	non diagnostic metal	total	domestic ceramic	industrial ceramic	structural ceramic	modified ceramic	total	LOCATION
2			2	1.21			5.7	6.91					0	TOP-5-6
2.14			2.14	0.14		1.99	2.09	4.22					0	TOP-5-7
			0					0					0	TOP-5-8
			0	12.24	0.54	2.06	663.9	678.74					0	TOP-6-1
9.87	25.11	18.81	53.79	33.15	0.26	10.41	121.61	165.43	22.01				22.01	TOP-6-2
382.43		161.23	543.66	67.18	288.37	1.05	199.6	556.2					0	TOP-6-3
52.76		11.45	64.21		3.61	9.53	188.28	201.42	1.15				1.15	TOP-6-4
		82.63	82.63	4	3.41	0.16	43.02	50.59					0	TOP-6-5
		4.92	4.92	18.15	9.25	4.46	159.38	191.24					0	TOP-6-6
0.29		1.4	1.69		2.67	5.95	57.85	66.47					0	TOP-6-7
1290.5	**25.43**	**760.07**	**2076**	**779.9**	**343.61**	**923.61**	**7064.7**	**9111.8**	**94.88**	**6.34**	**386.41**	**1.23**	**488.86**	

natural plant material	*artefactual plant material*	*charcoal*	*landsnail*	*insect*	*residue*	*total*	*TOTAL*	*LOCATION*
0.14		0.01			5.55	5.7	28	TOP-5-6
0.03					3.06	3.09	12.84	TOP-5-7
						0	0.03	TOP-5-8
2.35					62.03	64.38	778.47	TOP-6-1
0.35		0.08			38.1	38.53	427.34	TOP-6-2
0.79	0.77	0.4			223.71	225.67	1560.19	TOP-6-3
0.29	0.12				81.51	81.92	505.15	TOP-6-4
0.13	0.18	0.12		0.5	32.77	33.7	226.17	TOP-6-5
0.32	0	0.34	0		39.47	40.13	273.46	TOP-6-6
0.01		0.07			20.33	20.41	98.11	TOP-6-7
309.71	**2.12**	**250.29**	**3.36**	**0.95**	**9250.49**	**9816.92**	**50361.74**	

MARINE REMAINS											
pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*economic sub total*	*total*	*LOCATION*
337.18	8.12	254.2	560.58				1544.15		1160.08	2704.23	GS-TP1-04
440.88		304.75	511.2				610.1	103.42	1256.83	1970.35	GS-TP1-05
426.28		307.98	641.25				1054.28	133.2	1375.51	2562.99	GS-TP1-05
201.15		476.81	657.8				930.81	70.49	1335.76	2337.06	GS-TP1-06
263.13	2.84	323.15	730.1				831.12	100.98	1319.22	2251.32	GS-TP1-06
231.37	1.47	450.75	527.56				885.2	141.74	1211.15	2238.09	GS-TP1-07
810.72		360.56	536.33				810.72	85.34	1707.61	2603.67	GS-TP1-07
515.12		219.03	322.12				711.6	43.89	1056.27	1811.76	GS-TP1-08
695.33		261.68	550.21				718.36	105.32	1507.22	2330.9	GS-TP1-08
1000.25	8.74	93.85	480.22				290.76		1583.06	1873.82	GS-TP1-09
923.86		161.55	559.36				494.1	148.58	1644.77	2287.45	GS-TP1-09
1155.32		59.25	343.34				266.28	110.22	1557.91	1934.41	GS-TP1-09
795.02	5.2	100.67	541.36				705.24	180.16	1442.25	2327.65	GS-TP1-09-B
1260.28	6.62	107.7	340.53				179.09	88.3	1715.13	1982.52	GS-TP1-10
730.54		64.3	430.04				361.24	228.68	1224.88	1814.8	GS-TP1-10
534.4		55.23	432.58				1088.97		1022.21	2111.18	GS-TP1-10-A
1186.5		60.88	239.1				129.99		1486.48	1616.47	GS-TP1-10-B
757.82		43.37	509.22				1054.75		1310.41	2365.16	GS-TP1-10-C
1354.8	4.96	73.87	425.4				186.62		1859.03	2045.65	GS-TP1-10-D

GAVIN'S SITE

GAVIN'S

pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*economic sub total*	*total*	*LOCATION*
1309.2		94.85	272.3				139.43	96.09	1676.35	1911.87	GS-TP1-10-E
1219.94	0.85	172.24	200.44				117.77	33.16	1593.47	1744.4	GS-TP1-11
858.2		74.8	453.24	0.14			437.5	160.23	1386.38	1984.11	GS-TP1-11S
1019.47		124.22	508.94	0.21			373.41	93.52	1652.84	2119.77	GS-TP1-12
128.73		7.63	126.76				119.26	45.4	263.12	427.78	GS-TP1-12
1371.8	3.3	79.63	161.8				49.56	4	1616.53	1670.09	GS-TP1-12S
153.24		106.83	415.88				470.54	200.03	675.95	1346.52	GS-TP1-13
852.73		58	38.33				294.95	69.85	949.06	1313.86	GS-TP1-13S
1532.66		49.55	153.6				79	2.5	1735.81	1817.31	GS-TP1-13S
1240.3		58.61	98.86				523.13		1397.77	1920.9	GS-TP1-14S
1482.5		5.15	137.33				82.35		1624.98	1707.33	GS-TP1-14S
232.3		185.34	730.54				793.45	136.1	1148.18	2077.73	GS-TP1-14S
222.7		186.77	871.94				829.01	246.4	1281.41	2356.82	GS-TP1-15
1183.04		91.64	214.89				513.84	19.91	1489.57	2023.32	GS-TP1-15S
1344.63		29.55	118.45				68.52	17.24	1492.63	1578.39	GS-TP1-15S
1199.38		65.43	73.81				16.46		1338.62	1355.08	GS-TP1-16S
985.22	7.75	108.83	594.65				421.67	150.31	1696.45	2268.43	GS-TP1-16S
1457		28.59	130.54				68.13	1.05	1616.13	1685.31	GS-TP1-17S
807.67		59.05	253.63				358.46	87.29	1120.35	1566.1	GS-TP1-17S
170.33	8.4	157.87	614				914.73	125.13	950.6	1990.46	GS-TP1-18
360		33.47	141.67				89.41	7.93	535.14	632.48	GS-TP1-18S
916.63		106.25	521.67				333.66	86.16	1544.55	1964.37	GS-TP1-18S
908.92		90.05	365.01				323.7	97.9	1363.98	1785.58	GS-TP1-19
1243.22		65.5	208.1				240.02	54.39	1516.82	1811.23	GS-TP1-19S
1042.29	4.95	42.5	370.76				173.79	80.65	1460.5	1714.94	GS-TP1-20S
164.17	1.25	31.33	193.68				183.92	68.19	390.43	642.54	GS-TP1-20S

GAVIN'S SITE

GAVIN'S

pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*ECONOMIC SHELL*	*total*	*LOCATION*
1309.33		33.17	121				76.8		1463.5	1540.3	GS-TP1-20S
291.95		228.56	1056				945.6	90.26	1576.51	2612.37	GS-TP1-21
1243.57	7.8	66.7	201.74				186.56	52.14	1519.81	1758.51	GS-TP1-21S
831.15		107.05	411.72				536.04	180.61	1349.92	2066.57	GS-TP1-21S
3.11		71.42	322.92				459.38		397.45	856.83	GS-TP1-22
122.85		9.31	73.55				15.78	5.52	205.71	227.01	GS-TP1-22S
462.15		16.8	148.25				72.04	24.89	627.2	724.13	GS-TP1-22S
302.55		178.67	819.17	0.26			514.8	184.3	1300.65	1999.75	GS-TP1-23
1607.95		29.74	135.36	0.02			96.56	9.06	1773.07	1878.69	GS-TP1-23S
1329.58		39.9	240.45				335.66	79.26	1609.93	2024.85	GS-TP1-23S
1535.14	5.72	37.33	99.9				33.56	38.74	1678.09	1750.39	GS-TP1-24S
98.37		12.21	55.05				40.7	44.27	165.63	250.6	GS-TP1-25S
218.67		4.45	78.05				85.84	57.29	301.17	444.3	GS-TP1-26S
46382.59	**77.97**	**6728.57**	**21072.28**	**0.63**	**0**	**0**	**24268.37**	**4190.09**	**74262.04**	**102720.5**	**0**

GAVIN'S SITE

GAVIN'S

						BONE									
fishy bone	*fishy cranio*	*fishy scales*	*otolith*	*marine mammal*	*total*	*sheep/goat*	*cattle*	*bird*	*macropod*	*non diagnostic mammal*	*other*	*non diagnostic bone*	*burnt bone*	*total*	*LOCATION*
					0									0	GS-TP1-04
					0									0	GS-TP1-05
0.2		NEG			0.2									0	GS-TP1-05
					0									0	GS-TP1-06
					0									0	GS-TP1-06
					0									0	GS-TP1-07
					0									0	GS-TP1-07
					0									0	GS-TP1-08
					0									0	GS-TP1-08
					0									0	GS-TP1-09
					0									0	GS-TP1-09
					0									0	GS-TP1-09
					0									0	GS-TP1-09-B
5.84					5.84									0	GS-TP1-10
					0									0	GS-TP1-10
					0									0	GS-TP1-10-A
					0									0	GS-TP1-10-B
					0									0	GS-TP1-10-C
					0									0	GS-TP1-10-D

GAVIN'S SITE

GAVIN'S

fishy bone	fishy crania	fishy scales	otolith	marine mammal	total	sheep/goat	cattle	bird	macropod	non diagnostic mammal	other	non diagnostic bone	burnt bone	total	LOCATION
					0									0	GS-TP1-10-E
		0.01			0.01									0	GS-TP1-11
					0									0	GS-TP1-11S
					0									0	GS-TP1-12
					0									0	GS-TP1-12
					0									0	GS-TP1-12S
					0									0	GS-TP1-13
					0									0	GS-TP1-13S
					0									0	GS-TP1-13S
					0									0	GS-TP1-14S
					0									0	GS-TP1-14S
					0									0	GS-TP1-14S
					0									0	GS-TP1-15
					0									0	GS-TP1-15S
					0									0	GS-TP1-15S
					0									0	GS-TP1-16S
					0									0	GS-TP1-16S
					0									0	GS-TP1-17S
					0									0	GS-TP1-17S
					0									0	GS-TP1-18
					0									0	GS-TP1-18S
					0									0	GS-TP1-18S
					0									0	GS-TP1-19
					0									0	GS-TP1-19S
					0									0	GS-TP1-20S
0.08					0.08									0	GS-TP1-20S

GAVIN'S SITE

GAVIN'S

fisby bone	*fisby crania*	*fisby scales*	*otolith*	*marine mammal*	*total*	*sheep/goat*	*cattle*	*bird*	*macropod*	*non diagnostic mammal*	*eggshell*	*non diagnostic bone*	*leather*	*total*	*LOCATION*
					0									0	GS-TP1-20S
0.08					0.08									0	GS-TP1-21
					0									0	GS-TP1-21S
0.6					0.6									0	GS-TP1-21S
					0									0	GS-TP1-22
					0									0	GS-TP1-22S
					0									0	GS-TP1-22S
					0									0	GS-TP1-23
					0									0	GS-TP1-23S
					0									0	GS-TP1-23S
					0									0	GS-TP1-24S
0.07					0.07									0	GS-TP1-25S
					0									0	GS-TP1-26S
6.87	**0**	**0.01**	**0**	**0**	**6.88**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

GAVIN'S SITE

GAVIN'S

ARTIFICIAL																	
diagnostic glass	*structural glass*	*modified/ artefactual glass*	*non diagnostic glass*	*total*	*metal wires*	*tin fragments*	*other metal*	*clothing*	*boat fittings*	*non diagnostic metal*	*total*	*domestic ceramic*	*industrial ceramic*	*structural ceramic*	*modified ceramic*	*total*	*LOCATION*
				0						0.25	0.25					0	GS-TP1-04
				0							0					0	GS-TP1-05
				0	0.02						0.02					0	GS-TP1-05
				0							0					0	GS-TP1-06
				0	2.39						2.39					0	GS-TP1-06
				0							0					0	GS-TP1-07
				0	3.99						3.99					0	GS-TP1-07
				0							0					0	GS-TP1-08
				0	2.24		0.54				2.78					0	GS-TP1-08
				0							0					0	GS-TP1-09
				0							0					0	GS-TP1-09
				0	7.07						7.07					0	GS-TP1-09
				0							0					0	GS-TP1-09-B
				0							0					0	GS-TP1-10
				0							0					0	GS-TP1-10
				0							0					0	GS-TP1-10-A
				0							0					0	GS-TP1-10-B
				0	181					3.14	184.14					0	GS-TP1-10-C
				0							0					0	GS-TP1-10-D

GAVIN'S SITE

GAVIN'S

diagnostic glass	*structural glass*	*modified/ artefactual glass*	*non diagnostic glass*	*total*	*metal wires*	*tin fragments*	*other metal*	*[illegible]*	*boat fittings*	*non diagnostic metal*	*total*	*domestic ceramic*	*industrial ceramic*	*structural ceramic*	*modified ceramic*	*total*	*LOCATION*
3.92				3.92	11.96						11.96					0	GS-TP1-10-E
4.21				4.21	8.6						8.6					0	GS-TP1-11
			0.6	0.6	2.84						2.84					0	GS-TP1-11S
				0	12.86						12.86					0	GS-TP1-12
				0							0					0	GS-TP1-12
				0							0					0	GS-TP1-12S
				0	1.2						1.2					0	GS-TP1-13
				0							0					0	GS-TP1-13S
				0							0					0	GS-TP1-13S
				0							0					0	GS-TP1-14S
				0							0					0	GS-TP1-14S
				0							0					0	GS-TP1-14S
				0	2.77						2.77					0	GS-TP1-15
				0							0					0	GS-TP1-15S
				0							0					0	GS-TP1-15S
				0							0					0	GS-TP1-16S
				0							0					0	GS-TP1-16S
				0							0					0	GS-TP1-17S
				0			1.4				1.4					0	GS-TP1-17S
				0							0					0	GS-TP1-18
				0							0					0	GS-TP1-18S
				0	2.38						2.38					0	GS-TP1-18S
				0	2.48						2.48					0	GS-TP1-19
				0							0					0	GS-TP1-19S
				0	5.17						5.17					0	GS-TP1-20S
				0							0					0	GS-TP1-20S

GAVIN'S SITE

GAVIN'S

diagnostic glass	*structural glass*	*modified/ artefactual glass*	*non-diagnostic bottle glass*	*total*	*metal wires*	*tin fragments*	*structural metal*	*clothing*	*boat fittings*	*other metal*	*total*	*domestic ceramic*	*industrial ceramic*	*structural ceramic*	*modified ceramic*	*total*	*LOCATION*
				0							0					0	GS-TP1-20S
				0							0					0	GS-TP1-21
				0							0					0	GS-TP1-21S
				0							0					0	GS-TP1-21S
				0							0					0	GS-TP1-22
				0							0					0	GS-TP1-22S
				0							0					0	GS-TP1-22S
				0							0					0	GS-TP1-23
				0							0					0	GS-TP1-23S
				0							0					0	GS-TP1-23S
				0							0					0	GS-TP1-24S
				0	0.24						0.24					0	GS-TP1-25S
				0							0					0	GS-TP1-26S
8.13	**0**	**0**	**0.6**	**8.73**	**247.21**	**0**	**1.94**	**0**	**0**	**3.39**	**252.54**	**0**	**0**	**0**	**0**	**0**	**0**

GAVIN'S

MISCELLANEOUS										
natural plant material	*artefactual plant material*	Structural Plant	[illegible]	*charcoal*	*landsnail*	*insect*	*residue*	*total*	***TOTAL***	*LOCATION*
17.68							63.94	81.62	2786.1	GS-TP1-04
							74.27	74.27	2044.62	GS-TP1-05
	0.4						49.29	49.69	2612.9	GS-TP1-05
							41.68	41.68	2378.74	GS-TP1-06
							55.63	55.63	2309.34	GS-TP1-06
							59.19	59.19	2297.28	GS-TP1-07
							77.22	77.22	2684.88	GS-TP1-07
0.15							115.36	115.51	1927.27	GS-TP1-08
							82.7	82.7	2416.38	GS-TP1-08
							64.53	64.53	1938.35	GS-TP1-09
							103.21	103.21	2390.66	GS-TP1-09
							77.36	77.36	2018.84	GS-TP1-09
1.75							80.63	82.38	2410.03	GS-TP1-09-B
							256.1	256.1	2244.46	GS-TP1-10
							96.09	96.09	1910.89	GS-TP1-10
							82.84	82.84	2194.02	GS-TP1-10-A
2.76							78.98	81.74	1698.21	GS-TP1-10-B
2.06							88.87	90.93	2640.23	GS-TP1-10-C
							117.8	117.8	2163.45	GS-TP1-10-D

GAVIN'S

natural plant material	*artefactual plant material*	*Structural stone*	*other stone*	*charcoal*	*landsnail*	*insect*	*residue*	*total*	***TOTAL***	*LOCATION*
							111.93	111.93	2039.68	GS-TP1-10-E
							94.56	94.56	1851.78	GS-TP1-11
							102.25	102.25	2089.8	GS-TP1-11S
							140.33	140.33	2272.96	GS-TP1-12
							23.62	23.62	451.4	GS-TP1-12
							163.24	163.24	1833.33	GS-TP1-12S
							53.48	53.48	1401.2	GS-TP1-13
0.2							78.17	78.37	1392.23	GS-TP1-13S
							111.97	111.97	1929.28	GS-TP1-13S
								0	1920.9	GS-TP1-14S
							103.22	103.22	1810.55	GS-TP1-14S
0.43							87.77	88.2	2165.93	GS-TP1-14S
							100.6	100.6	2460.19	GS-TP1-15
							129.52	129.52	2152.84	GS-TP1-15S
							105.94	105.94	1684.33	GS-TP1-15S
							129.86	129.86	1484.94	GS-TP1-16S
							121.75	121.75	2390.18	GS-TP1-16S
							117.5	117.5	1802.81	GS-TP1-17S
							105.19	105.19	1672.69	GS-TP1-17S
							87.47	87.47	2077.93	GS-TP1-18
							83.03	83.03	715.51	GS-TP1-18S
							92.41	92.41	2059.16	GS-TP1-18S
				0.11			84.4	84.51	1872.57	GS-TP1-19
							79.92	79.92	1891.15	GS-TP1-19S
							73.77	73.77	1793.88	GS-TP1-20S
							29.41	29.41	672.03	GS-TP1-20S

GAVIN'S SITE

GAVIN'S

natural plant material	*artefactual plant material*	*structural plant*	*edible plant*	*charcoal*	*landsnail*	*insect*	*residue*	*total*	**total**	*LOCATION*
							91.49	91.49	1631.79	GS-TP1-20S
0.16							88.03	88.19	2700.64	GS-TP1-21
							91.27	91.27	1849.78	GS-TP1-21S
							90.89	90.89	2158.06	GS-TP1-21S
1.41							27.32	28.73	885.56	GS-TP1-22
							84.34	84.34	311.35	GS-TP1-22S
							36.36	36.36	760.49	GS-TP1-22S
							97.86	97.86	2097.61	GS-TP1-23
0.01							103.38	103.39	1982.08	GS-TP1-23S
	0.14						86.7	86.84	2111.69	GS-TP1-23S
							109.19	109.19	1859.58	GS-TP1-24S
0.61					0.11		15.69	16.41	267.32	GS-TP1-25S
0.7				0.9	0.41		33.52	35.53	479.83	GS-TP1-26S
27.92	**0.54**	**0**	**0**	**1.01**	**0.52**	**0**	**5033.04**	**5063**	**108051.7**	

GAVIN'S SITE

GAVIN'S

pearlshell	*gastropod*	*oyster*	*bivalve*	*chiton*	*crab*	*burnt shell*	*non economic shell*	*non diagnostic shell*	*SHELL*	*total*	*LOCATION*
									117.14	117.14	GS-TP2-01
									18.58	18.58	GS-TP2-02
									225.01	225.01	GS-TP2-03
									93.02	93.02	GS-TP2-04
									178.55	178.55	GS-TP2-05
					1.33				177.39	178.72	GS-TP2-06
					0.83				476.53	477.36	GS-TP2-07
					0.39				229.32	229.71	GS-TP2-08
									323.87	323.87	GS-TP2-09
									230.08	230.08	GS-TP2-10
									190.87	190.87	GS-TP2-11
									167.25	167.25	GS-TP2-12
									383.19	383.19	GS-TP2-13
									239.34	239.34	GS-TP2-14
									67.84	67.84	GS-TP2-15
									133.09	133.09	GS-TP2-16
									130.98	130.98	GS-TP2-17
									148.23	148.23	GS-TP2-18
									58.49	58.49	GS-TP2-19
									1.33	1.33	GS-TP2-20
										0	GS-TP2-21
									12.96	12.96	GS-TP2-22
										0	GS-TP2-23
										0	GS-TP1-24
0	**0**	**0**	**0**	**0**	**2.55**	**0**	**0**	**0**	**3603.06**	**3605.61**	**0**

GAVIN'S SITE

GAVIN'S

fishy bone	*fishy crania*	*fishy scales*	*otolith*	*marine mammal*	*total*	*sheep/goat*	*cattle*	*bird*	*macropod*	*non diagnostic mammal*	*eggshell*	*non diagnostic bone*	*leather*	*total*	*LOCATION*
					0									0	GS-TP2-01
					0						0.22			0.22	GS-TP2-02
					0									0	GS-TP2-03
					0									0	GS-TP2-04
					0			0.56			0.27		4.95	5.78	GS-TP2-05
					0	32.91		2.2			0.05			35.16	GS-TP2-06
					0			1.54					35.53	37.07	GS-TP2-07
					0			0.57			0.19			0.76	GS-TP2-08
					0								17.96	17.96	GS-TP2-09
					0									0	GS-TP2-10
					0									0	GS-TP2-11
					0								20.9	20.9	GS-TP2-12
0.22					0.22								146.28	146.28	GS-TP2-13
					0						0.36			0.36	GS-TP2-14
0.35					0.35						0.38			0.38	GS-TP2-15
0.16					0.16						0.92	0.13		1.05	GS-TP2-16
					0			1.94			0.17	0.41		2.52	GS-TP2-17
					0									0	GS-TP2-18
					0									0	GS-TP2-19
					0		28.57							28.57	GS-TP2-20
					0									0	GS-TP2-21
					0									0	GS-TP2-22
					0									0	GS-TP2-23
					0									0	GS-TP1-24
0.73	**0**	**0**	**0**	**0**	**0.73**	**32.91**	**28.57**	**6.81**	**0**	**0**	**2.56**	**0.54**	**225.62**	**297.01**	**0**

GAVIN'S SITE

GAVIN'S

diagnostic glass	*structural glass*	*modified/ artefactual glass*	*non-diagnostic bottle glass*	*total*	*metal wires*	*tin fragments*	*structural metal*	*clothing*	*boat fittings*	*other metal*	*total*	*domestic ceramic*	*industrial ceramic*	*structural ceramic*	*modified ceramic*	*total*	*LOCATION*
41.35	8.78		12.3	62.43	11.96	1608.9					1620.8	22.32				22.32	GS-TP2-01
200.33			8.44	208.77		605.72					605.72					0	GS-TP2-02
			98.33	98.33		1649.8					1649.8	1.74				1.74	GS-TP2-03
39.17			40.71	79.88		730.53					730.53					0	GS-TP2-04
62.8			71.87	134.67	2.63	716.11					718.74					0	GS-TP2-05
			69.67	69.67		790.8	33.52		206.61	130.57	1161.5					0	GS-TP2-06
543.23	14.73		45.46	603.42	10.48	1879		1.53			1891					0	GS-TP2-07
			90.34	90.34		577.55				0.16	577.71					0	GS-TP2-08
			25.73	25.73	5.89	777.32					783.21					0	GS-TP2-09
89.55			69.89	159.44		656.88					656.88					0	GS-TP2-10
12.78			26.36	39.14	13.2	786.62					799.82	19.67				19.67	GS-TP2-11
				0		726.71					726.71	34.52				34.52	GS-TP2-12
			27.14	27.14		854.65					854.65	16.98				16.98	GS-TP2-13
			14.71	14.71	7.18	204.61			1.01	5.04	217.84	11.45				11.45	GS-TP2-14
			0.7	0.7		122.1					122.1	13.27				13.27	GS-TP2-15
			9.79	9.79		57.19					57.19					0	GS-TP2-16
0.57			1.54	2.11	3.13	66.24				5.49	74.86					0	GS-TP2-17
94.04			1.26	95.3	0.79	70.89					71.68	3.98				3.98	GS-TP2-18
8.76			4.03	12.79	4.24	101.5					105.74	9.85				9.85	GS-TP2-19
				0		138.75					138.75					0	GS-TP2-20
437.11				437.11	6.33	90.28					96.61					0	GS-TP2-21
				0		796.79					796.79					0	GS-TP2-22
				0		71.36					71.36					0	GS-TP2-23
				0		1.2					1.2					0	GS-TP1-24
1529.7	**23.51**	**0**	**618.27**	**2171.5**	**65.83**	**14080**	**33.52**	**1.53**	**207.62**	**141.26**	**14530**	**133.78**	**0**	**0**	**0**	**133.78**	**0**

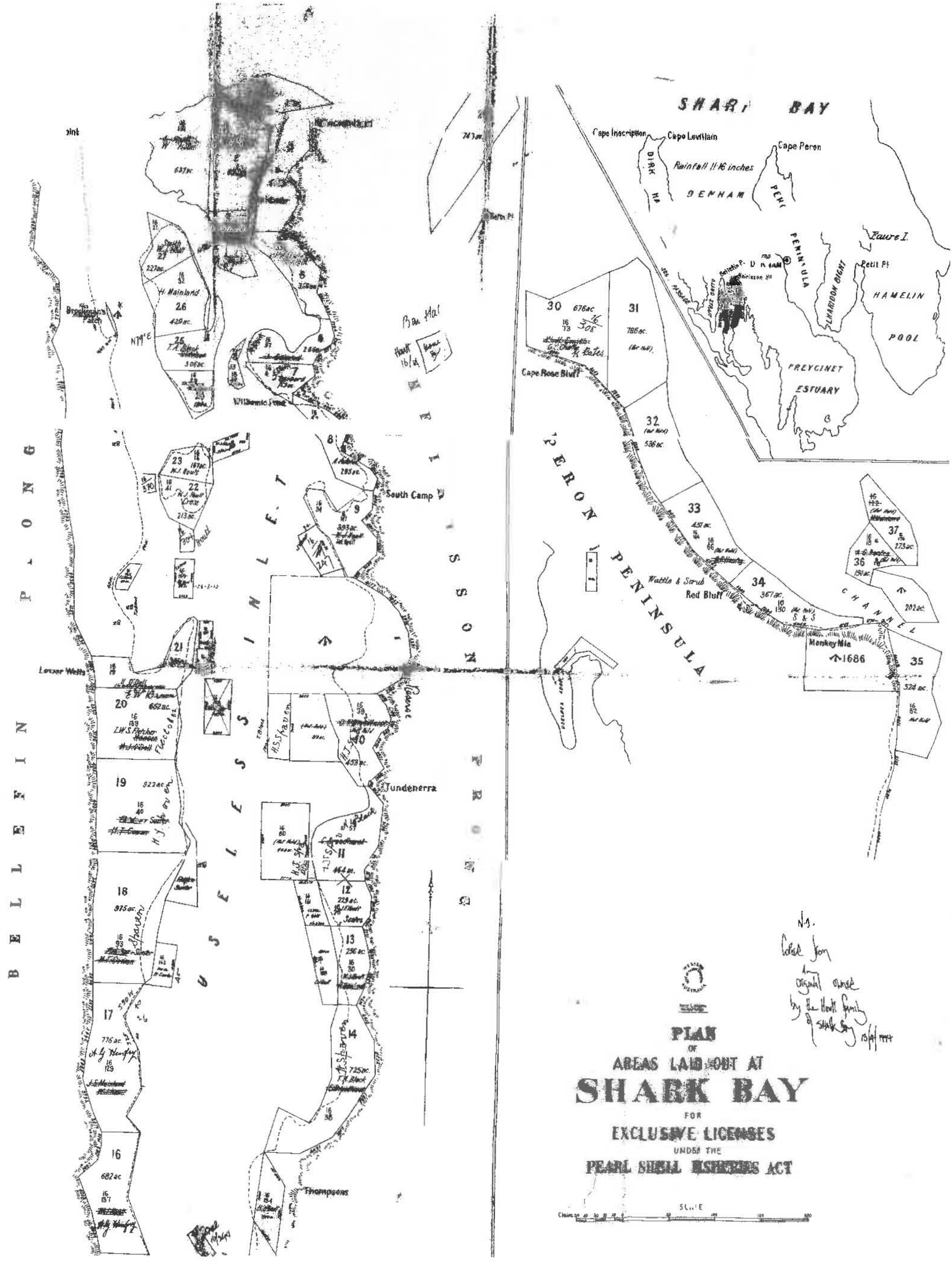
GAVIN'S SITE

GAVIN'S

natural plant material	*artefactual plant material*	*structural plant*	*edible plant*	*charcoal*	*landsnail*	*insect*	*residue*	*total*	***total***	*LOCATION*
				11.69				11.69	1834.42	GS-TP2-01
				6.3	1.83			8.13	841.42	GS-TP2-02
		3.24		34.94	2.05			40.23	2015.09	GS-TP2-03
				10.31				10.31	913.74	GS-TP2-04
				16.84	0.41			17.25	1054.99	GS-TP2-05
				32.88				32.88	1477.93	GS-TP2-06
				56.15	2.2			58.35	3067.18	GS-TP2-07
		0.31		14.56	1.83			16.7	915.22	GS-TP2-08
	29.6	0.54		17.66	0.72			48.52	1199.29	GS-TP2-09
	1.64			17.4	0.01			19.05	1065.45	GS-TP2-10
	1.31	0.91		14.66	0.85			17.73	1067.23	GS-TP2-11
			0.1	14.65	0.95			15.7	965.08	GS-TP2-12
11.88	93.4			41.95	0.72			147.95	1576.41	GS-TP2-13
	1.05			72.03	0.7			73.78	557.48	GS-TP2-14
				15.26	6.84			22.1	226.74	GS-TP2-15
				32.41	1.13	0.09		33.63	234.91	GS-TP2-16
				10.43	0.93			11.36	221.83	GS-TP2-17
				2.5	2.45			4.95	324.14	GS-TP2-18
				2.44	4.87			7.31	194.18	GS-TP2-19
				6.9	1.57			8.47	177.12	GS-TP2-20
				0.63	2.03			2.66	536.38	GS-TP2-21
					3.75	0.13		3.88	813.63	GS-TP2-22
					7.52			7.52	78.88	GS-TP2-23
					5.6	0.01		5.61	6.81	GS-TP1-24
11.88	**127**	**5**	**0.1**	**432.59**	**43.36**	**0.22**	**0**	**620.15**	**21358.74**	

APPENDIX SIX

MAP OF SHARK BAY PEARLING LEASES


PLAN
OF
AREAS LAID OUT AT
SHARK BAY
FOR
EXCLUSIVE LICENSES
UNDER THE
PEARL SHELL FISHERIES ACT
SCALE
SHARK BAY
Cape Inscription
Cape Levillain
Cape Peron
Rainfall 11·16 inches
DENHAM
PENINSULA
Faure I.
Petit Pt
HAMELIN
POOL
FREYCINET
ESTUARY
L'HARIDON BIGHT
Cape Rose Bluff
PERON PENINSULA
Wattle & Scrub
Red Bluff
Monkey Mia
CHANNEL
South Camp
Tundenerra
Thompsons
Lower Wells
Brockmans Patch
H. Mainland
BELLEFIN PRONG
USSELS INLET
30
31
32
33
34
35
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37
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22
21
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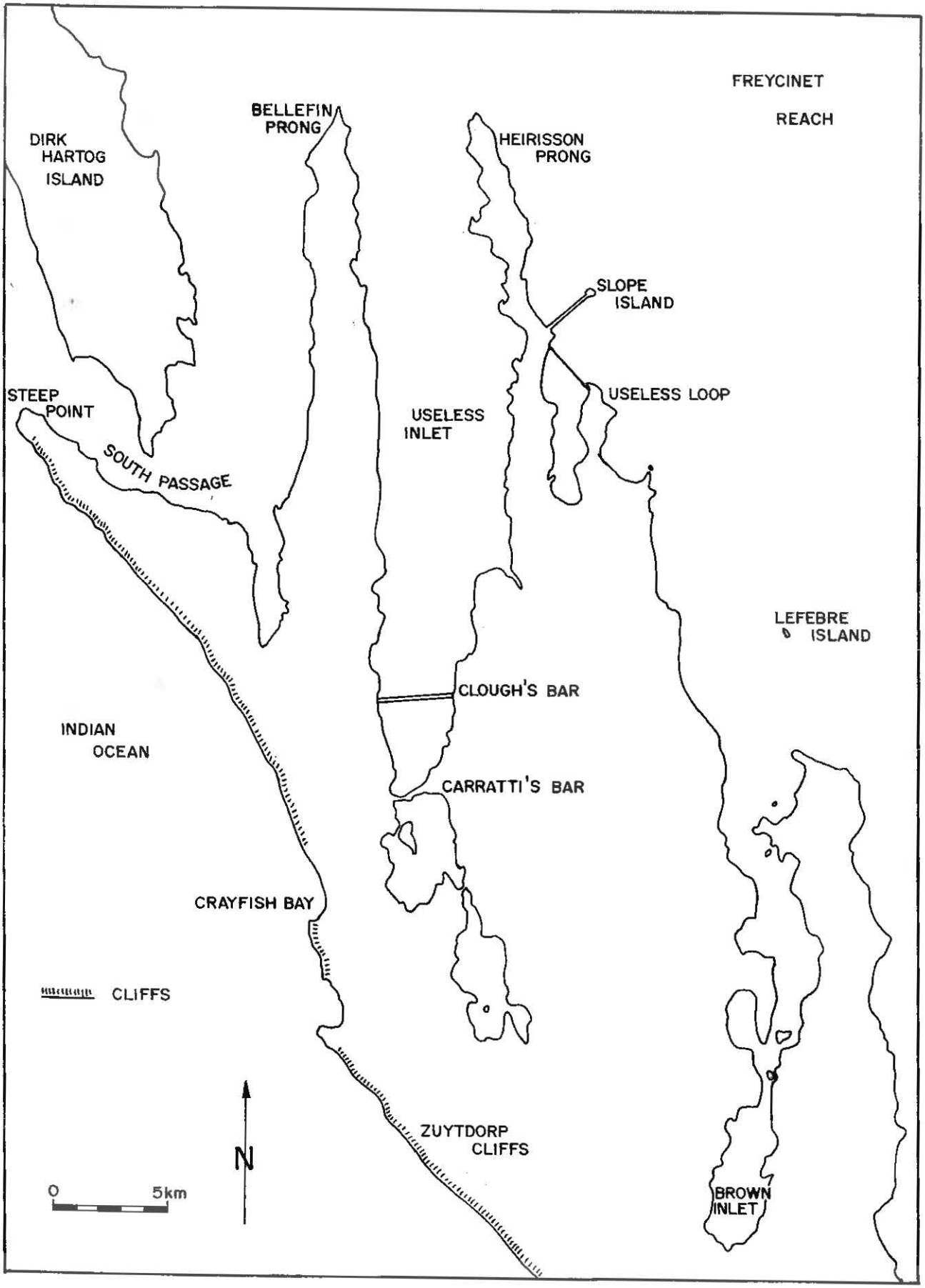
17
16
26
25
8
9
10
11
12
13
14
1686
676 ac.
786 ac.
536 ac.
451 ac.
367 ac.
524 ac.
273 ac.
202 ac.
652 ac.
822 ac.
815 ac.
776 ac.
682 ac.
429 ac.
306 ac.
227 ac.
213 ac.
285 ac.
393 ac.
453 ac.
464 ac.
229 ac.
256 ac.
725 ac.
H.S. Shaven
T.A. Black
A.G. Henfry
N.1.
Copied from original owned by the Hoult family of Shark Bay



Useless Inlet and Dirk Hartog Island