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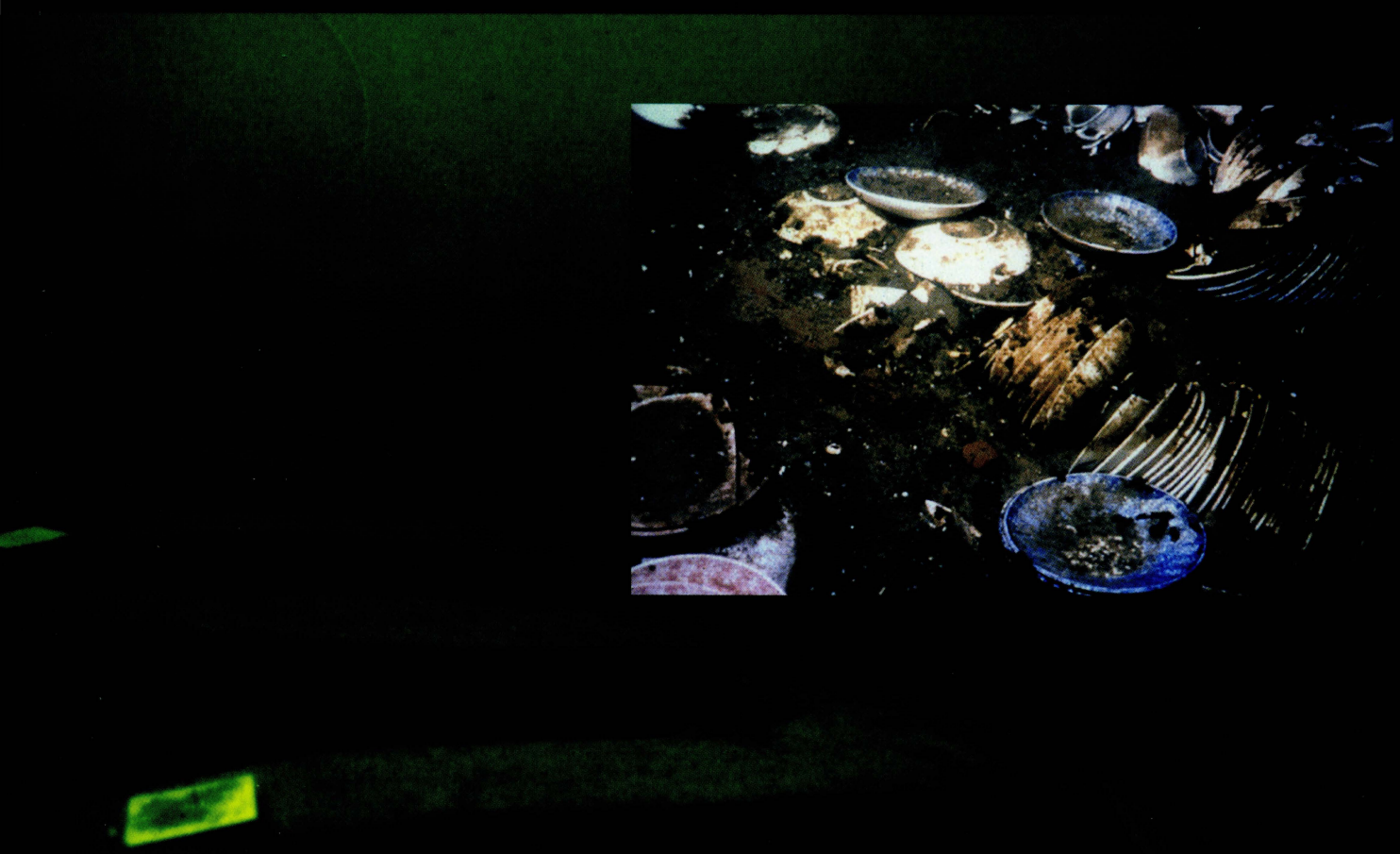

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A preliminary examination of the history and archaeology of the pearl shelling industry in Torres Strait

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Background

The following paper is submitted as a final report for the 1999 Australian Institute for Maritime Archaeology (AIMA) Scholarship. It presents a background to the pearl shelling industry in Torres Strait and documents preliminary results from fieldwork undertaken as a result of the assistance provided by the 1999 Inaugural AIMA Scholarship.

The broad aim of the project was to undertake a critical and structured examination of the archaeological and historical evidence associated with the land based pearl shelling stations of Torres Strait. It focuses on the different cultural and ethnic groups that were involved in the pearl shelling industry and highlights the socio-economic, cultural and maritime technological transformations that these cultures brought to Torres Strait. This research forms part of the author's PhD that is being undertaken within the School of Anthropology, Archaeology and Sociology at James Cook University, Townsville.

In order for this research to be realised, a close working relationship has been established with the Kaurareg community, who assert rights of traditional ownership over the islands, and who have allowed access and granted permission for research to be undertaken on their islands.

Introduction

Maritime and historical archaeological research into Australian marine industries has, to date, focused largely on the industries of whaling (see Lawrence & Staniforth 1998) and sealing (Townrow, 1989; Stuart, 1989; Gibbs, n.d., in prep.). This work has documented the crucial role that these industries played in the exploration and settlement of Australia along with the generation of exports and development of associated industries.

Archaeological investigations of the pearl shell and pearling industries of Western Australia have been conducted by Henderson (1981, 1983), McCarthy (1989, 1994), Stanbury (1994), Moore (1994) and Burningham (1994) amongst others. Although both Henderson and McCarthy refer to the pearl shelling industries in the Northern Territory and Torres Strait, no significant archaeological research has been conducted in these regions. Henderson (1981,1983) details the development of the pearling lugger suggesting further research is necessary to enable an understanding of Australia as a maritime nation, Australia's maritime traditions and the influence that the lugger had upon both Australian and overseas boat builders. McCarthy (1989, 1994) on the other hand provides a detailed history of the pearling and pearl shelling industries of Western Australia with references to pearl shelling in Torres Strait. McCarthy also documents crucial elements of the industry such as the introduction of 'diving apparatus' and 'floating stations'.

Torres Strait

According to Yonge (1930: 163–164), the Australian pearl shell fishery was the fourth of the great pearl fisheries of the world to be discovered. It extended from Torres Strait and the northern end of the Great Barrier Reef, westward to the shores of Western Australia and north-west to the Aru Islands, south-west of New Guinea. It was primarily, although not exclusively, a mother-of-pearl shell fishery, with the shell being either the Gold or Silver lip variety, *Pinctada maxima*. The world supply of *Pinctada maxima* was minimal (250 tons imported to London annually) until the Australian beds were discovered. This discovery, along with improved manufacturing techniques, led to an increase in demand for this particular species of pearl shell (Bach 1961: 106).

In order to trace the influx of European people into the Torres Strait, and therefore the subsequent pearl shell industry, it is necessary to follow the movements of traders that were operating within the Pacific region. As Ganter (1994: 15) points out, the fishery in Far North Queensland began long before the push for settlement land in the Cape York region. There was no pressure through pastoral expansion, gold mining or from 'land-hungry Europeans'. Indeed, Wilson (1924: 108) makes the observation that the pioneers of the pearling and *bêche-de-mer* industries ventured north from Sydney when there was little settlement on the coast of Queensland north of Brisbane.

These South Pacific traders were known to be 'resource raiders' who followed and exploited both tradeable resources and labour. With no direct ownership over the resources they were exploiting, they moved from one resource base to another as they were depleted. This very process is what drove the South Pacific traders into Torres Strait in the early 1860s as the returns from whaling and sandalwood resources became marginal. The Torres Strait *bêche-de-mer* beds were seen as a viable resource and as a consequence traders set up stations. In turn, these traders brought with them Pacific Islanders who had not only previously proved their ability as crew, but also were a cheap and exploitable labour source that was able to

adapt to different industries (Mullins 1995: 70; Ganter 1994: 17).

Haddon (1935: xiii) outlines the need to document the era (1849–1871) when both the *bêche-de-mer* and pearl shelling industries in Torres Strait rapidly evolved. He believed that this documentation, of the subsequent European and South Sea Islander influx, would make most interesting and doubtless unsavoury reading as the events of this troublous period affected the natives very adversely in every way and that the ill effects persisted for a long time.

Captain William Banner is generally credited with the first large scale shipment of pearl shell from Torres Strait in 1869. The actual discovery and collection of the pearl shell was made by Captain William Banner's men and specifically a Tongan diver known either as Tongatapu Joe, Joe, Joseph John or Iae (Mullins, 1995: 5; Hopkins, 1995: 572; Fuary, 1991: 146; Bain, 1982: 45).

Banner had come to Torres Strait as an experienced Pacifc trader and master having worked in the South Seas around Lifu and other islands (McFarlane, 1954: 17). In 1863 Banner established a *bêche-de-mer* station on Warrior Island operating on the model of Pacific trading. In order to sustain this industry he employed 70 South Sea Islanders and no doubt some of the members of the 43 families that lived on Warrior Island (Ganter, 1994: 20; Bain, 1982: 42; McFarlane, 1954: 17).

Banner went to Sydney in 1869 taking with him four men from Warrior Island and left Tongatapu Joe, an experienced seaman, in charge of the *bêche-de-mer* station. While Banner was away, the Warrior Islanders showed Tongatapu Joe and the Pacific Islanders the shell beds from which they manufactured their pearl shell chest ornaments. When Banner returned, the Pacific Islanders had collected six tons of pearl shell. Banner's employer, James Merriman of Sydney, instructed Banner to forego the collection of *bêche-de-mer* and concentrate on pearl shell. Additional vessels were sent and 50 tons were collected in a matter of months (Haysom, 1999: 29–30; Hopkins, 1995: 572; Fuary, 1991: 146; Bain, 1982: 45; Lack, 1963: 145).

In a number of years, pearl-shelling vessels were dispersed throughout the whole of the Torres Strait. Mullins (1995: 78) states that from Warrior Reef the pearl shell vessels worked Moa Pass, then the passage between Friday and Prince of Wales Islands and then Endeavour Strait. This movement also brought about the evolution of land-based pearl shelling stations and by 1872 *bêche-de-mer* and/or pearl shelling stations were located on Warrior, Brothers, Darnley and Murray Islands, while semi-permanent 'floating stations' were sited on Coconut and Campbell Islands (Mullins 1995: 78). By 1886 there were pearl shelling stations on Mount Ernest, Prince of Wales, Albany, Wai Weer, Banks, Jervis, Possession, Good's, Moa, Badu, Bourke, Friday, Campbell and Thursday Islands and at Somerset and in Endeavour Strait (Ganter, 1994: 244; Loos, 1982:120; Chester, 1879: 492)

Pearl shelling stations

The aim of the current research is to document the pearl shelling stations within the Prince of Wales Island group of Islands (i.e. Prince of Wales, Good's, Wai Weer, Friday, Hammond and Thursday Islands). The Inaugural AIMA Scholarship played an integral part in allowing the author to position and survey pearl shelling stations on all of the above islands and conduct detailed and extensive surveys. Additionally, pearl shelling stations have been recorded on Maubiag Island and potential sites examined on Badu and Murray Islands.

From historical research it has been determined that the majority of these pearl shelling stations had a house where either the owner or a European manager lived, a house for the pearl shellers, jetties, wharves, diving gear provisions and kitchen facilities. At most stations, stores were kept for the men and boats; boats were outfitted; provisioning and repairs were conducted; and pearl shell was received, cleaned, packed and despatched (DeHoughton, 1880: 3; Streeter, 1886: 165; Douglas, 1886: 490; Schnukal, 1998: 42). The buildings were usually constructed of corrugated iron and contained most of the essentials of home life and were by no means devoid of comfort or taste (Coppinger, 1885: 196; Douglas, 1886: 490; Schnukal, 1998: 42). Coppinger (1885: 196) records that the stations often had a white-washed house (residence of the white manager) and a few large grass-built huts in which the labourers resided. Loos (1982:120) describes some of these stations as comprising small villages.

The initial field season recorded substantial features associated with the pearl shelling stations and the industry as a whole. Archaeological surveying techniques were used to conduct extensive surveys of Wai Weer Island and Good's Island, while specific features were surveyed and recorded on Prince of Wales, Friday Island, Horn Island, Hammond Island, Thursday Island and Mabuiag Island. Surface collections were made in conjunction with the surveys on Wai Weer Island and Good's Island and consisted of various items including ceramics, glass, personal items, pearl shell, boat repair equipment, and boat construction materials. Features such as boat slipways, boat building equipment, wrecks of pearl shelling vessels, substantial rock groynes, signal stations, managers' and workers' living quarters, wells, garden areas and substantial graves were located and recorded in detail. The substrate was probed and tested to determine the geomorphology of the sites allowing for the future planning of test pits and excavation to be carried in early 2001.

The preliminary results of the survey indicate key areas on the islands that may be correlated with function and the ethnicity of the pearl shellers. It is beyond the scope of this paper to detail all of the pearl shelling stations and the spatial relationships between or within stations. It is clear, however that the stations themselves were located in areas that allowed for either the construction of artificial groynes or were naturally sheltered from the harsh weather conditions of Torres

Strait. Slipways and boat repair areas were also constructed on gently sloping beaches and shell processing areas kept separate from dwelling and garden areas. European or managers' dwellings were separate again and often located at elevated vantage points.

The features recorded on Wai Weer Island confirm the presence of designated areas by function and ethnicity. Government reports (Queensland Votes and Proceedings 1890) show the population on Wai Weer Island consisted of people from European, South Sea Islander, Malay and Philippine origin. Additionally an unpublished report, written by Japanese author, Kyuhara (1977), documents the ruins of stone buildings on Wai Weer Island that he believes are Japanese dwellings. Recent surveying of Wai Weer Island identified and recorded this feature and locates it in an area that is separate from other dwelling features. Other dwelling areas located and recorded include a manager's residence (European), a South Sea islander dwelling area (grass huts), and accommodation for person to operate the flagstaff and signal station.

Additionally Kyuhara (1977), also comments on the intricate stonework of both the jetties and the stone walls present on the island, suggesting again, a Japanese style. The jetties and stone walling were recorded in detail, by the author, allowing differences to be drawn about features on other islands with pearl shelling stations which did not host Japanese populations. An intricate and significant stone path was also uncovered and recorded showing similar style of stonework. Pearl shell processing areas were located and surveyed showing a clear demarcation from other features and revealing artefacts associated with the practice. A similar process was adopted for the slipway and boat repair area with artefacts, such as copper sheathing, sheathing tacks and nails, ballast stones and forge remains, again giving a clear indication of the function of the site.

Site conservation and management issues

The islands on which the pearl shelling stations were located have, over time, also been utilised for other purposes either at the same time that the stations were operational or in subsequent years. Other structures and artefacts that were associated with such uses and activities present in the archaeological record include, traditional Aboriginal Kaurareg sites, pilot stations, schools, signal stations, a lighthouse, a coaling station, hospital, quarantine station, leper lazaret and substantial World War II defence posts. This list does not include the transformation of Thursday Island after it became the official government settlement in 1876, or contemporary houses not located on Thursday Island. Although these alternative uses have affected the preservation of the pearl shelling sites, they are also present in the archaeological record and will contribute to a broader regional analysis.

There appears to be no immediate threat to the structures associated with the pearl shelling stations on the uninhabited islands such as Wai Weer Island and Good's Island. However, the significant increase in development on Thursday Island is having a marked impact on sites such as slipways, groynes, and buildings associated with the pearl shelling industry. These sites have been partially recorded by the author with the intention of a more comprehensive survey and recording program to be completed. Additionally the sites on Prince of Wales, Horn and Friday Islands all face pressures from expanding residential development. Day visitors to the islands are also known to collect old bottles and ceramics from the sites and there is no interpretive signage present.

Conclusions

It is envisaged that through further surveying, excavation and the continued analysis of the current data and artefact collections a better understanding will be developed as to how such early maritime industrial sites actually operated and the ethnic diversity of the workforce which operated them.

Another important aspect of this research, that will contribute to the above, is the study of the development of maritime technologies due to the expansion of the pearl shell industry within Northern Australia. These technologies, often associated with different cultures crewing and operating the boats, will be analysed through a comparative study of luggers, mother ships and swimming boats. The tracing of cultural movements between pearl shelling centres of northern Australia will inform an analysis of changes in maritime technology and styles through time.

Acknowledgements

As this research is being conducted into a relatively new topic area of archaeology, I would like to acknowledge the following organisations and people for their support, assistance and encouragement. Kaurareg Traditional Owners; James Cook University—Martin Gibbs and Peter Veth; Torres Strait Regional Authority—Garrick Hitchcock and Kevin Murphy; Museum of Tropical Queensland–Peter Illidge and Coleman Doyle; Thursday Island Historical Society—Leanne Miller; and the people assisting in the field, Matthew Tuftee, Anna Morgan, Libby Illidge and Michael Morrison.

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Polynesian fishing implements from the wreck of HMS *Pandora*: a technological and contextual study

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The story of *Pandora*'s voyage and the ensuing archaeological investigation has been told by Peter Gesner in his report on the first five seasons of excavation (Gesner, 2000). The present study was brought to mind by the recovery from the wreck of many artefacts of Polynesian origin, in particular items of fishing tackle. Artefacts within the scope of the study first appeared in 1983 and were recovered from all the subsequent excavations except one. Table 1 shows the numbers acquired in the various years.

1983	1984	1986	1993	1995	1996
2	5	10	0	5	24

Table 1. Acquisition rate of the selected artefacts.

Description of the assemblage

The artefacts comprising the assemblage dealt with herein are components of what is collectively known in modern anglers' language as 'terminal tackle' (Young, 1974), for the fairly obvious reason that it is attached to the end of the fishing line furthest from the fisher. Its nature varies with the method of fishing, which in turn depends upon the species sought by the fisher.

There are 46 items in the assemblage and they fall into three groups. One group, the most obvious for identification of use, is of fish-hooks; another is of component parts of trolling lures or spinners; and, the third is of parts from the specialized lures designed to capture the octopus. All the artefacts are identified by permanent registration numbers assigned for Queensland Museum use and these numbers are employed in the present study. When a registration number covers more than one item an arbitrarily numbered subdivision has been made. The drawings are computer reductions of those made by the writer during an attachment to the Queensland Museum.

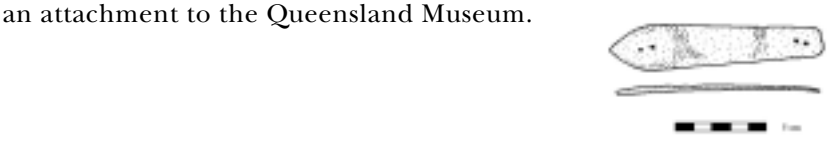

Figure 1. MA21

This is the body of a fishing lure from the excavation at the stern of the wreck. It is made of bone, 148 mm long, 33 mm wide tapering to 17 mm and the maximum depth from the flat side is 19 mm. A hole is bored transversely across the rounded end, while from the flat side there are four holes bored obliquely so as to meet in pairs at each end.

Figure 2. MA157

Also discovered in 1983, but in what was found to be the midships part of the wreck in the excavation around the cannon, was the fragment of a boat-shaped lure, protruding from a small concretion. The overall length, including the concretion is 42 mm. The lure is cut from shell and the unconcreted portion is 13 mm long and 8 mm wide. A transverse hole is bored through it.

Figure 3. MA690

From 1984, locations can be related to grid squares and the work-site had moved in that year to grid square 71. The first artefact of interest to be found was this large bone lure, measuring 165 mm in length. The breadth at the widest part is 31 mm, tapering to 20 mm before a circumferential groove which has been cut adjacent to the flattened end. In addition to a transverse hole across the 'head', there are two pairs of oblique and joining holes at that end of the flat side, and another such pair about 15 mm from the groove. There is fairly extensive surface cracking as indicated in the drawing.

Figure 4. MA762

The second item of fishing tackle found in grid square 71 was a lure body cut from thin shell. It measures 217 mm in length and is 28 mm wide, tapering to 19 mm. The maximum thickness is 4 mm. A pair of holes is bored at each end.

Figure 5. MA776
The next artefact found in grid square 71 was the first item to be associated with the catching of the octopus. The construction of octopus lures will be discussed later. This lure component is a cowrie shell (*Cypraea sp.*), with holes bored in two places. It is 61 mm long, 43 mm wide and 30 mm high.

Figure 6. MA777
A second, whole cowrie shell was found in grid square 71 in 1984, with two holes bored in the same relative locations as in the previously described artefact. It can be deduced, therefore, that it was worked for the same purpose. This one is larger, with length 81 mm, breadth 50 mm and height 41 mm.

Figure 7. MA778
From grid square 71, this artefact is a worked plate of cowrie shell. The shell has been cut to form a domed ovoid, with a hole bored at each end. The presence of this artefact is indicative of another method of constructing octopus lures. The measurements are length 66 mm, breadth 49 mm and height 12 mm.

Figure 8. MA1204
The first of the artefacts of interest found in 1986 was a lure body fabricated from shell. It is fish-shaped, but with an oblique grooving of the concave side to make it rotate in passage through water. It measures 116 mm long, 19 mm at its broadest dimension and is 15 mm to the deepest point of the 'keel'.

Figure 9. MA1435
This hook was excavated from grid square 70. It has been cut from a fairly flat piece of shell to form an easily recognizable hook shape. It measures 80 mm on the long axis, 47 mm wide and is 7 mm thick, diminishing in thickness towards the edges.

Figure 10. MA1509
This item is a small fish-shaped lure cut from thin flat shell, found in grid square 89. It has two holes cut near the pointed end and the other end appears to be broken. It is 38 mm long, 8 mm wide and about 2 mm thick.

Figure 11. MA1550/1
Three lure bodies found together in grid square 72 were registered under the same number. This one is made of bone cut to the classical shape to be 129 mm long, 23 mm wide tapering to 11 mm and measures 14 mm at its thickest part. It has two oblique drill-holes joining across the 'head' and two holes penetrating the thickness, about 30 mm from the other end. These two are joined by a groove cut in the flat side. From the flat side, there are two holes joining obliquely at the 'head' end and three holes drilled to join each other at the opposite end.

Figure 12. MA1550/2
The second in a group of three under the same registration is a lure body cut from thin, slightly curved shell. The length is 130 mm, maximum breadth is 33 mm and the greatest thickness is 5 mm. A pair of holes is bored through it at each end and one end is obliquely truncated.

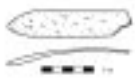

Figure 13. MA1550/3
The group of three is completed by another flat shell lure body. This one is covered with a hard white deposit and the end is broken off. Two holes penetrate

it near the pointed end. It is 117 mm long, 26 mm wide and its thickest part measures 6 mm.

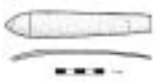

Figure 14.MA1567
Found in 1986 in grid square 72 was a well made flat shell lure body. It has a symmetrical torpedo shape, ending in a slight concavity, with notches at each side. There is a marked transverse step cut 25 mm from the point and pairs of holes penetrate each end. It is 150 mm long, 27 mm wide and up to 5 mm thick.

MA1671
The first of the comparatively few hooks to be excavated unfortunately proved impossible to find among the thousands of registered artefacts. It is recorded as being a shell hook found in 1986 in grid square 74.

Figure 15.MA1723
A spinner-type lure body manufactured from shell was recovered from square 72. Its shape and finish resemble a small fish. It has a transverse hole at the pointed end and lateral notches at the other. The measurements are 76 mm long, 13 mm wide and 7 mm deep.

Figure 16.MA1730
The last item from 1986 was a lure body, rather roughly fabricated from shell and recovered from grid square 70. It is cut obliquely to spin and has a transverse perforation about 20 mm from the point. Length is 111 mm, breadth is 18 mm and depth is 16 mm.

Figure 17.MA4072
This curiously shaped lure body was taken from grid square 70 in 1995. The two cuts made in its roughly fish-shaped body must have given it an irregular movement through the water. This may have been an attempt to simulate an injured fish. It has a transverse hole through the 'head' and is 88 mm long, 13 mm wide and 14 mm deep.

Figure 18.MA4091

The next fishing item to be found in grid square 70 was a lure body made of bone and almost of the shape now becoming familiar. The difference is that what is a planar surface on previously encountered artefacts is cut in an angle towards the point. Two holes penetrate the pointed end and towards the other end, two oblique holes join. It is 148 mm long, 31 mm wide and 19 mm deep.

Figure 19.MA4101
The second hook in the serial discovery of the assemblage came from grid square 70 in 1995. It is of an elegant shape and cut from an organic material suspected to be coconut shell. The length is 58 mm, width across the bend is 34 mm and the thickness is about 2 mm. The point is sharply incurved to produce a narrow gap of 12 mm.

Figure 20.MA4113
This lure body, found in 1995 in grid square 70, is cut from shell into a spinner shape resembling a small fish. It has a transverse hole 17 mm from the point and two lateral notches at the other end. The measurements are 85 mm long, 14 mm wide and 14 mm deep.

Figure 21.MA4162
The last item from grid square 70 in 1995 was a shell lure body similar to the last, but with an even more definite cut to make it spin. It has a transverse perforation 20 mm from the point and shallow lateral notches at the other end. The length is 93 mm, the breadth is 16 mm and the depth is 14 mm.
Note: During the 1996 *Pandora* expedition, which was after the assignment of the study subject for a thesis, the number of artefacts within the scope of the study was doubled. As all the following items were excavated in 1996, the date need not be reiterated. Following the expedition, circumstances of time and conservation

requirements limited the opportunities for close examination. The drawings, therefore, show single aspects of the artefacts.

Figure 22.MA4546
The first artefact of interest in 1996 came from grid square 90. It is cut from shell into an approximation of the shape of a small fish. There is a hole through the 'head' and barely discernible notches at the other end. It is 70 mm long, 12 mm wide and 12 mm deep.

Figure 23.MA4547
The next was found in grid square 90. It is an angular bone hook, which appears to be made from a left scapula, utilizing the natural ridges. It is rather large to have been fabricated from a pig scapula, so the bone might be assumed to be human. The longer limb measures 95 mm and the shorter, 68 mm. It is perforated near the end of the longer limb and again in the angle. There are small cuts and abrasions around the point of the hook.

Figure 24.MA4548
This lure body was cut from bone and found during excavation of grid square 89. It has a hole through the pointed end and there is a slight notch visible on one side at the other end. It measures 145 mm long, 26 mm wide and 18 mm deep.

Figure 25.MA4563
This very small lure body is made from shell and was found on checking the spoil heap during the excavation of grid square 89. It is 56 mm long and has one transverse hole near the point.

Figure 26.MA4564
This plate of shell cut from a cowrie and perforated at diametrically opposite points could be a dress ornament. It is included because it could, with equal probability, be part of an octopus lure. Its measurements at right-angles are 48 mm and 42 mm. It was recovered from grid square 89.

Figure 27.MA4580
This lure body made from shell came from grid square 89. It has a comparatively large hole through the 'head' and is grooved circumferentially at the other end. It is 89 mm long, 10 mm wide and 10 mm deep.

Figure 28.MA4587
This artefact from grid square 89 appears to be the point section of a large compound wooden hook At the end away from the point can be seen the flat, stepped area which formed one side of a scarfed joint. The distance from end to end is 164 mm.

Figure 29.MA4588
Also from grid square 89 there was recovered another wooden hook section with the same features as the previous artefact, particularly the evidence of a scarfed joint. A remnant of cordage was present near the joint. The overall length is 210 mm.

Figure 30.MA4590
This ovoid plate of shell cut from a cowrie and perforated at each end is most probably a component of an octopus lure. It measures 74 mm on the long axis and 52 mm on the short axis. It came from grid square 89.

Figure 31.MA4593
This small lure body from grid square 89 shows signs of extensive working to produce from shell a spinning

bait. It has a transverse hole 15 mm from the point and measures 90 mm in length, 13 mm in breadth.

Figure 32. MA4613/1
The first of three small lure bodies found together in grid square 89 and registered under the same number, this one is perforated transversely where the eye of the little fish would be. It is 75 mm long and has notches at the tail end.

Figure 33. MA4613/2
The second of this group is the smallest unbroken lure body yet found, being a mere slip of shell 40 mm long. Only the perforation distinguishes it as a lure.

Figure 34. MA4613/3
The last of this group of shell lure bodies is fairly crude, with a relatively large hole near the point and two notches at the other end. It is 75 mm long.

Figure 35. MA4632
This hook, carved in bone, was also found in grid square 89. Its overall dimensions are 45 mm by 35 mm. The point is sharply incurved to give a narrow gape of about 10 mm. It is pitted all over from its long burial.

Figure 36. MA4646
This item, another small lure body made from shell, came from the now prolific area of grid square 89. It is 72 mm long.

Figure 37. MA4665
This artefact was excavated from grid square 89. It is of white stone worked into a bullet shape, but with a longitudinal groove. It is a component of an octopus lure, 93 mm long, with a diameter of 52 mm.

Figure 38. MA4709
From grid square 89, this irregularly formed shell lure body has a hole through its thickest part. It is 80 mm long.

Figure 39. MA4736
In contrast to MA4709, this lure body from grid square 89 is carefully formed from shell into a spinner. It is perforated transversely about 15 mm from the point and has two notches at the other end. It is 79 mm long and 12 mm wide.

Figure 40. MA4744
This carved piece of bone is the hook component of a compound trolling or spinning lure. Measuring only 45 mm, it is the only one in the assemblage. It was found during the excavation of grid square 89.

Figure 41. MA4757
This shell lure body from grid square 89 measures 76 mm and has a single transverse perforation.

Figure 42. MA4763
This wooden spike, from grid square 89, may be part of the shank of a large wooden hook. It is 147 mm long.

Figure 43. MA4779
Cut from shell, this lure body shows a marked variation from previous shapes. It has a single perforation, is 93 mm long and came from grid square 89.

Figure 44. MA4785
Another find unique in this assemblage, from grid square 89, is this point for a wooden hook, fabricated from shell. It measures 41 mm overall and, from bend to point, about 20 mm.

Figure 45. MA4898

	Shell	Bone	Wood	Coconut
Hooks	3	2	3	1
Lures	24	6	0	0

Table 2. Hook and lure components.

The last artefact in this catalogue is an ovoid plate cut from a cowrie shell to be part of an octopus lure. Its long axis measures 75 mm and the short axis 62 mm.

The inventory of hook and lure components recovered from the wreck so far may be summarised as Table 2.

Items identified as parts of octopus lures are a stone sinker, two drilled cowrie shells and four plates of cowrie shell.

At this stage it is difficult to visualise how some of the artefacts such as MA4665 and MA4744 might perform their stated functions as components of complete units of fishing tackle. Later sections will show how the components are integrated.

Technology, construction and provenance of the fishing implements—evolution of the implements and their manufacture

Among the islands of the Pacific, fish, as a source of food protein varies from being an important contribution to a balanced diet to being the only available animal protein. When Te Rangi Hiroa studied the material culture of Tongareva (Hiroa, 1931), pigs and dogs were absent so that successful fishing was a matter of supreme importance. Even in Hawaii, where various animals including pigs and dogs were domesticated, these were regarded as ritual foods and fish provided the staple diet (Kirch, 1985). It is logical to expect early sophistication of fishing technologies in Polynesia and this will be shown to have been the case.

Every conceivable method of taking fish has been devised by the indigenous peoples of the Pacific. Douglas Oliver (1989) on the cultures of Oceania lists taking by hand, with or without the aid of stupefying poisons, netting in many forms, spearing, noosing, the construction of many types of fish trap and line fishing. The last method is our present concern with regard to terminal tackle.

Technology is, of course, dependent on the available raw materials both for the product and for the tools. In the absence of metals, tools must be made from whatever natural materials come to hand. Widely separated archaeological sites have yielded similar tools for the production of fish-hooks and lures, but the most comprehensive collection has come from the intensive investigations in Hawaii. Most of the sites there produced large numbers of tools as well as hooks, finished and unfinished (Emory, Bonk & Sinoto, 1959). These broken and abandoned tools included 'coral and lava saws and files, shell drill points and coral balance wheels for the drills'. Finishing files were the bevelled spines of the slate-pencil sea-urchin (*Heterocentrotus sp.*). At one site the authors counted 4 372 coral files and 7 342 sea-urchin files to 1 710 hooks. Arne Skjølsvold (1972) in his excavation of a habitation cave in the Marquesas Islands found 73 coral files. He remarked in his paper, 'coral files form the most numerous artefacts in most Marquesan sites' (Skjølsvold, 1972).

During a reconnaissance survey in the Marshall Islands, Paul Rosendahl found 'numerous examples of these tools' (Rosendahl, 1987). In a comparison of sites in Hawaii, the Marquesas Islands and the Society Islands, Yosihiko Sinoto found variations in the discovery of the tools used to make fish-hooks (Sinoto, 1967). Drilling tools have been found only in Hawaii, but Sinoto points out that the evidence from the hooks is that similar drilling techniques were used in all three locations and that drilling tools were found in the Society Islands in historical times. Drill points were the axis of the knobby spindle shell (*Fusinus sp.*), complete *Mitra* shells or instead were made from obsidian. Sea-urchin spines were mainly used in Hawaii, while files of branch coral (*Acropora sp.*) as opposed to *Porites* were confined to the Society Islands where sea-urchin files were few. An ethno-archaeological study by Michael Kaschko on Uki Island in the Southeast Solomons discovered traditional fishing lures being shaped by stone and coral files (Kaschko, 1976).

The materials from which hooks and lures are made must fulfill several requirements. They must be strong enough to hook and hold fish of the target species; must be workable with available tools and must be present in the reasonably immediate surroundings in sufficient quantity. H.G. Beasley, at the start of his descriptive work, *Fish Hooks* (Beasley, 1928) lists the materials encountered. Leaving out New Guinea and New Zealand because they are outside the scope of this study, these materials are:

Figure 46. Incomplete hooks from archaeological sites in the Hawaiian, Marquesas and Society Islands (Sinoto, 1967).

Shell—pearl, *Trochus, Pinna, Tridacna, Haliotis.*
Bone—human, turtle, whale.
Turtle shell.
Whale ivory.
Wood.
Coconut shell.

Ocean Island or Banaba is a small island with a steep drop-off into deep water and the inhabitants, therefore, have no supply of shell to make hooks or lures. Also because of the minimal shallows off their shores, their main fishery is pelagic, largely for bonito. From sheer necessity, the unique lures of Ocean Island were made from pieces of stalactite from the local caves, ground into the required shapes. Mahaffy, a visitor to the island in 1896 and 1910, is quoted by Maude and Lampert as writing:

> The fish-hook used on the island for the taking of bonito is a very curious one and I think unique in the Pacific. The shank is made of a piece of semi-transparent stalactite, almost like alabaster...(Maude & Lampert, 1967).

Sinoto (1967) adds to the list of materials dog and pig bones, with, in smaller quantities, fish and bird bones, dog and whale teeth and cowrie shells, but says that pearl shell was the preferred material, if available. In the same paper, he gives a lucid description of manufacturing methods.

In the making of shell hooks, the exterior surface of the complete shell was first ground off to expose the translucent inner layer. The first stage for bone and the second for shell was to saw out a rectangular tab of the appropriate size. Next, a bone tab would be ground flat on each side or sometimes only to remove the spongy bone if already reasonably flat. The outer edges of these hook blanks were then filed or chipped to form the outer curvature of the hook. The inner curvature was formed either by filing a notch of increasing size from one edge of the blank or by drilling. A single drill hole formed a barbless hook, while drilling two holes produced a barbed hook. Figure 46, taken from Sinoto's (1967) paper, clearly shows these techniques. Further filing then smoothed off the blanks to produce finished hooks.

Figure 47. A bonito lure (after Hiroa, 1932).

The fabrication of the composite lures or trolling hooks employed the same techniques of sawing and filing, but with the drilling of much smaller holes. Captain James Wilson of the British ship *Duff* said of the natives of the Society Islands:

> It is astonishing how they can, with such ease and quickness, drill holes in a pearl shell with a shark's tooth, and so fine as not to admit the point of a common pin (Wilson, 1799).

Considerable skill must have been acquired in order to integrate a strong and effective unit from the various parts. This is even more evident in those lures in which a thin plate of shell was fitted to bone or wood to make the body. Figure47 shows a typical lure, in this instance to be used in trolling for bonito. There is an account in considerable detail of the methods of manufacture of both hooks and lures from shell in an account of Cook's first voyage (Cook, 1894).

Archaeological evidence has told us little about the organic components of these lures or of the lines to which they and the hooks were attached, but there is historical and ethnological information in abundance.

Sir Joseph Banks, in his journal of the *Endeavour* voyage (Beaglehole, 1962), tells us that the Society Islanders made cordage of the fibres from hibiscus bark and that the twisting work was done by rolling on the thigh. He is particularly complimentary about the fishing lines 'made of the bark of a kind of frutescent nettle called by them *Erowa* (*Urtica argentea*)'. These are described as being 'infinitely stronger than silk lines which I had on board made by the best fishing shops in London, tho not so thick by almost half' (Beaglehole, 1962). The opinion of Sir Joseph Banks about these lines is reinforced by Captain James Cook

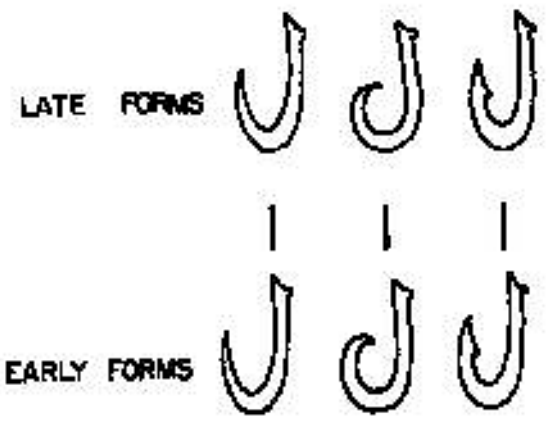

Figure 48. Lack of change in simple hooks (after Emory, Bonk and Sinoto, 1959).

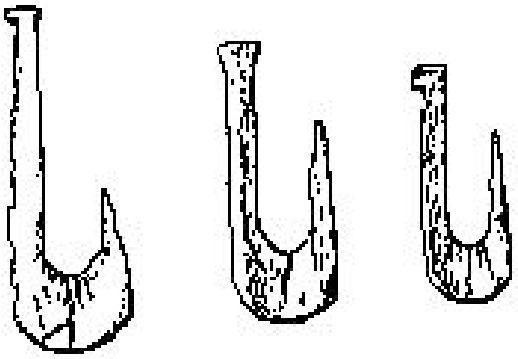

Figure 49. Neolithic bone fish-hooks (after Andersen, 1987).

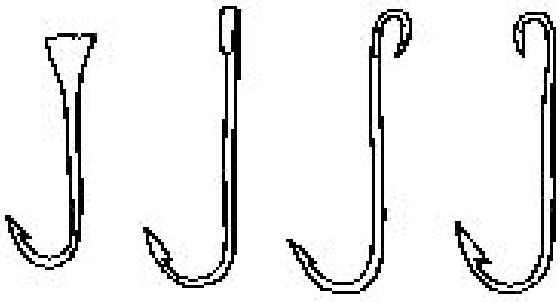

Figure 50. Bronze Age fish-hooks (after Coles and Coles, 1989).

in his journal of the same voyage. Having noted that the lines were made from the bark of a tree and from a 'kind of silk grass', he says: 'Their fishing lines…are in Point of goodness preferable to any of ours' (Cook, 1893).

A review of a selection of ethnological papers from different islands finds both common materials and variety. In Kiribati, the lines were made of coconut fibre, by itself or mixed with female hair for a finer line, while lure hackles were of pig bristle or coconut fibre (Koch, 1986). Lines in the Marquesas Islands were made of *fau* (hibiscus) bark, coconut fibre or pineapple fibre and pig bristles were attached to the lures (Linton, 1923). In Vaitupu in the Ellice Islands, lines were described by Donald Kennedy as being of hibiscus bark or sennit and the lure hackles were white sea-bird feathers (Kennedy, 1931). Te Rangi Hiroa gives sennit as being the line in Manahiki and Rakahanga and coconut fibre or pig bristle for the lure hackles (Hiroa, 1932). In Kapingamarangi, Hiroa found lines made of the bast of breadfruit and hibiscus and of coir, which is coconut fibre. The lure hackles were of breadfruit bast (Hiroa, 1950). In the Society Islands, E.S. Craighill Handy (1932) discovered that the smaller lines were twisted from the bast of *rowa* (*Urtica argentea*) and that the larger cordage originated in the bark of *Ficus tincturia* and other trees. The lure hackles were pig bristles (Handy, 1932). K.P. Emory in Tuamotu found that the fibres used to make the lines were from coconut, pandanus and hibiscus and that the hackles were black feathers from the frigate bird (Emory, 1975).

The above writers exhibit some misunderstanding of the meaning of the word 'sennit' or 'sinnet', appearing to use it to mean coconut fibre cordage. To quote an early nautical authority:

> Sinnet is a Line—made of Roape Yarnes—which are divided and platted One over Another, as they plat Horses Maines (Manwayring, 1644).

The many variations which can be applied to the interweaving of strands produce flat braids and round or even square cords (Ashley, 1944). The peoples of Oceania had many forms of sennit made of coconut fibre, but must have been aware that a long plaited line is of no use for fishing because it kinks. This does not apply to modern machine-woven lines.

Apart from slow developmental change from prehistoric times to the 18th century, the fish-hooks and lures exhibit both familial similarities and regional differences. Because of their purpose, the essential features are the same, and because they were necessary items for the voyagers of the Polynesian diaspora, familial characteristics have remained. Later periods of isolation have led to both improvement for practical reasons and probably to stylistic change, for the work of any craftsman is subject to individual aesthetic considerations. There is, however, little latitude for change without detracting from the artefact as a tool. Figure 48, which is a drawing of hooks from an

excavation in the South Point area, Hawaii, shows the similarities between simple hooks, although there is a time difference of manufacture of about 1 500 years (Emory, Bonk & Sinoto, 1959).

Significant technological advance needs new inventions and the introduction of new materials. The dramatic developmental change consequent upon the spread of use of the exciting new material, bronze, is illustrated by Figures 49 and 50. The first of these shows hooks made from red deer rib bones found in a submerged Ertebølle settlement at Tybrind Vig in Denmark (Anderson, 1987). The second drawing is of bronze hooks from an excavation at Cortaillod-Est in France (Coles & Coles, 1989), Both illustrations are obviously of fish-hooks, but the bronze hooks are strikingly modern in appearance, showing that once an effective design has been achieved there is little need to change it. Similarly, little change has occurred in the hooks and lures of Oceania from prehistoric times to the time of the introduction of metals.

Before discussing places of origin and related matters, the field can be reduced by restriction in the first instance to places visited by *Pandora*. It must be borne in mind, however, that fish-hooks and lures were trade items between islands. Peter Gesner of the Queensland Museum has examined the log of *Pandora* and noted on the chart the islands logged between the ship entering the Pacific and coming to grief on the Great Barrier Reef (Gesner, P., 1995, pers. comm.).

A list of the islands logged is as follows:

Morutea	Savai'i	Tutuila
Tuveia	Upolu	Manua
Otaheiti	Wallis I. (Uvea)	Vava'u
Huahine	Futuna	Eua
Bora Bora	Rotuma	Tongatapu
Aitutaki	Ha'apia	Nomuka
Palmerston I.	Nomuka	Niuofo'ou
Moorea	Tofua	Fataka
Atafu	Kao	Anuta
Nukunono	Upolo	Santa Cruz

Although the crew of *Pandora* may have seen all of these islands, opportunities for the acquisition of artefacts required contact with the indigenes. Examination of Captain Edwards' account of the voyage of *Pandora* (Edwards & Hamilton, 1915) discloses that two islands landed upon were found to be uninhabited and that no contact was made with the peoples of Morutea, Tuveia and Nukunono. The two uninhabited islands were Palmerston Island and Duke of York's Island (Moorea) where they found huts, canoes and other possessions, but no people.

An extended period was spent in Tahiti (Otaheiti). Landings were made on Huahine, Bora Bora, Savai'i, Upolu (twice), Ha'apia, Nomuka (twice), Tofua, Kao, Tutuila, Vava'u and Niuofo'ou. From some islands, canoes came out to the ship. These were Aitutaki, Manua, Eua, Tongatapu, Uvea and Rotuma. Edwards' narrative says that they bought only coconuts at Manua. Altogether, a considerable variety of opportunity arose for the arrival of items of native fishing tackle on board.

Figure 51. Tahitian hooks, Fuller collection (from Beasley, 1928).

Figure 52. Tahitian hook (from Anell, 1955).

Discussion of the hooks

Of the 46 artefacts in the assemblage under consideration, nine are hooks or parts of hooks and one of these items is a doubtful fragment. Four items are complete hooks, not including the hook which could not be found during the period of examination.

The first hook to return to the light was that registered as MA1435 and illustrated as Figure 9 above. It is made of grey shell, perhaps from the black pearl

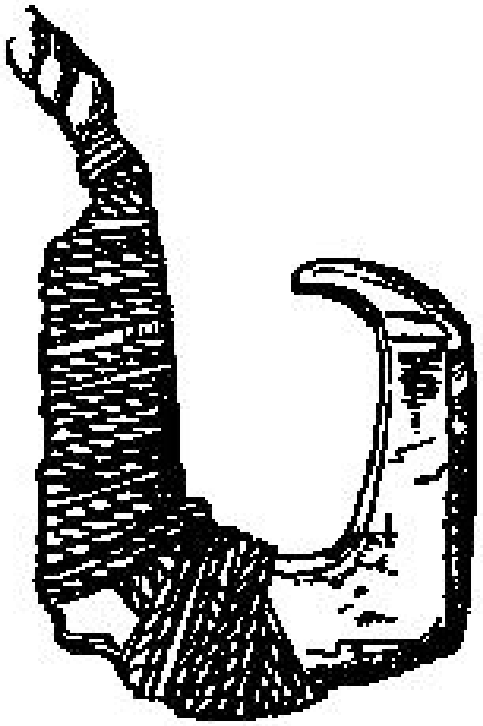

Figure 56. Bone hook from Tokelau (Anell, 1955).

Figure 53. Coconut shell hook (Beasley, 1928).

Figure 54. Bone hook (Beasley, 1928).

Figure 55. Bone hook from Fakaofu (Beasley, 1928).

oyster, presumably by the methods described above. The only hooks of the same material and the same general shape are described as being Tahitian (Beasley, 1928). Figure 51 shows two examples from the Fuller Collection (Force & Force, 1971). Beasley (1928) says that black pearl shell, as opposed to white, was used only in the Society Islands and in one locality in the Carolines. This information is substantiated by Bengt Anell who, in presenting similar hooks and others, states that only in Tahiti is there such a rich variety of types, all of pearl shell (Anell, 1955). Figure 52 is one of them.

The second hook was registered as MA 4101 and is depicted as Figure 19. It is a gracefully curved hook with a sharply incurved point and a spur near the top of the shank for attachment of the snood. (The snood is a short piece of cord firmly lashed to the shank of the hook and having a loop at the other end for joining to the fishing line. It allows easy changing of hooks.) The material of the hook is organic and is reasonably assumed to be coconut shell. Beasley says that the Union Group alone has provided examples of hooks made from this material (Beasley, 1928). One from Tokelau is in Figure 53. Anell shows a coconut shell hook of the same shape, also from Tokelau (Anell, 1955). There is a report of coconut shell hooks being made in the Cook Islands around 1810 (Gill, 1880), acknowledged by Beasley (1928). Similarly shaped hooks were made in Tahiti and Mangareva, but of

Figure 57. Scarf joint (Emory, 1975).

Figure 58. Shark hook (Kaeppler, 1978).

pearl shell, although it was said in Mangareva that coconut shell was formerly used (Anell, 1955). *Pandora* did not call at Mangareva.

According to Captain Edwards' narrative (Edwards & Hamilton, 1915), the natives of Nukunono avoided contact and abandoned their houses. These houses were examined by a landing party and perhaps the hook was pocketed at that time. Atafu or Oatafu, also in the Union Group, is logged as being visited but there is no mention of it in Edwards' account.

The hook registered as MA4547 (Fig. 23) may be a rarity. Those museums for whose collections published catalogues have come to hand have nothing similar. These are the collections by Sparrman (Söderström, 1939), Hooper (Phelps, 1976), Fuller (Force & Force, 1971) and Oldman (Oldman, 1953) and the collection in the Musées Royaux d'Art et d'Histoire in Brussells (Forment, 1981). The Cook voyage artefacts in museums in Leningrad, Berne and Florence have nothing like it (Kaeppler, 1978) and neither has Adrienne Kaeppler's *Artificial curiosities* (Kaeppler, 1978). One of two references found to such a hook is in Beasley (1928), whose plate is reproduced as Figure 54. This hook is slightly larger (115 mm). It has been in the Peabody Museum in Salem, Massachusetts, since 1824 and is recorded as being from the Marquesan Group. Beasley (1928) is of the opinion that the bone is whalebone, 'since nothing else exists in the Group capable of producing a bone of sufficient width'. It might be doubted that whalebone would have the necessary density and perhaps he did not think of a human adult male scapula. Two hooks in the US National Museum, of the same type and size, were collected by the Wilkes Expedition in 1839 from the Tuamotu Islands (Emory, 1975).

As *Pandora* did not call at any of the Marquesas or Tuamotu Islands, no firm deduction can be made on how such a hook came to be on board. It could have been an independent invention by an inhabitant of one of the islands visited or it could have been an import from the Marquesas or Tuamotus to one of the islands visited.

The hook, MA4632 (Fig. 35), does not have a counterpart in any of the museum catalogues above. Beasley has one with a familial resemblance, attributed to Fakaofo or Fakaafo, one of the Tokelau islands (Beasley, 1928). Anell has another from Tokelau (Anell, 1955), similar to that in Beasley's book both in the shape and in the manner of attachment of the line. These examples appear in Figures 55 and 56. There is a point of difference between the examples and the assemblage specimen in that the latter has a lug at the top of the shank to aid in the securing of the line. As Tokelau has the only recorded production of approximately the same hook shape, it is difficult to assess the significance of the lug. It could rule out the connection between the hook, MA4632, and Tokelau, although Tokelau was visited by *Pandora*.

Coming on to the hook fragments, the two designated as MA4587 (Fig. 28) and MA4588 (Fig. 29), can be treated together because each constitutes the same part of the same type of hook. According to Anell, such hooks were made in Tongareva, Tahiti and the Tuamotu Archipelago (Anell, 1955). Emory's paper on the material culture of the Tuamotu Archipelago (Emory, 1975) has a figure, reproduced here as Figure 57, which shows the scarf joint in a hook from the island of Reao.

The jointing was found necessary by the makers for the purpose of achieving large hooks. The sharp angle inwards of the hook point is typical of the drawings in Emory's paper and presumably of the local style in the Tuamotus. In contrast to this, the Society Island hooks of the same group form a smooth curve from shank to point. Being designed to take sharks, these wooden hooks are all large. Beasley includes a Society Island one measuring 434 mm overall from the Peabody Museum as plate LXIV. The Hooper collection catalogue contains another which measures 368 mm (Phelps, 1976). A hook in Vienna (Fig. 58), almost identical to that in Beasley's plate figures in *Artificial curiosities* (Kaeppler, 1978).

The proper curve for the larger part of these hardwood hooks was produced by exposing a root of the tree called aitu, which is casuarina or ironwood (*Pemphis acidula*), and training it to the proper shape (Handy, 1932). It was preferable to find a place where a suitable root was protruding from a bank, when the root was twisted and fixed in the proper curve. When large enough, it was cut and the soft outer layer removed before carving into the final shape. The

Figure 59. Cook island barracuda hook (Buck, 1927).

smaller part was then fitted by a scarfed joint and lashed firmly in place with plaited coir. A snood lashing over the tip of the shank and the protruding lug completed the hook.

The artefact registered as MA4785 (Fig. 44) appears to be the equivalent in shell of the separately manufactured incurving hook point found in the shark hooks. It was part of a much smaller hook than the massive shark hooks and it has proved difficult to find the type of hook of which it formed the point. Had the curve been less pronounced, this piece of shell could have been the point of a lure or of a different type of

Figure 60. Tuamotuan wood and pearl shell hook (Emory, 1975).

hook in which the point is fixed into a hole in the shank with mastic or a lashing or both. The shape, however, is entirely compatible with a U-shaped or V-shaped hook having a turned-in point.

V-shaped wooden hooks were used generally throughout the islands in fishing for ruvettus (*Ruvettus pretiosus*), a large deep water fish. These hooks were made from forked branches of ironwood and fitted with incurving wooden points. Those used for ruvettus were comparable in size to the shark hooks and therefore much too large for the specimen under consideration. The few references found of a wider use for wooden hooks of the same shape refer to the Lower Cook Group and the Tuamotu Archipelago. One is by Anell (1955), who says that smaller hooks, but otherwise completely similar, were used for barracuda fishing: 'The use of these smaller hooks is known from Aitutaki, Mauke, Raratonga and Mangaia'. P.H. Buck (1927) found ironwood hooks in Raratonga and Aitutaki which were used to fish for barracuda. At the time of his study the points were made of 'a piece of curved iron' (Buck, 1927). His sketch is included as Figure 59.

According to Emory (1975), the Bishop Museum in Honolulu has eight small composite hooks of wood from the Tuamotu Archipelago with points of wood, shell and turtle entroplastron or breastplate. The sizes of these hooks range in height from 31 to 132 mm. Figure 60 is Emory's illustration of a Tuamotuan hook with a pearl shell point and measuring 140 mm in height. Although the specimen would fit this hook very well, the Tuamotu Islands were off the track of *Pandora*. If a similar hook was acquired in Aitutaki, the shell material is not pearl. Pearl shell was only available in the Northern Cook Islands, Manahiki and Rakahanga (Buck, 1927).

The artefact, MA4763 (Fig. 42) is a short wooden spike with an obliquely flattened end. It is included in the assemblage because it was found adjacent to other items. The flat end shows no sign of a scarf joint and the object is straight, unlike the curved points of the large wooden hooks. It is very doubtful that it was part of a hook.

In the words of Anell (1955): 'There is no connection between the preserved hook types and the descriptions of the actual fishing methods, a lack that is felt all over Polynesia, though nowhere so strikingly as on Tahiti'. However, on the basis that the first hook above is very like hooks illustrated by Nordhoff (1930) for albacore, it may have been have been made for that fish. It is certainly a large hook for sizeable fish and adult albacore range in weight from 40 to 75 kg. In his very full description of the albacore tackle and techniques (Nordhoff, 1930), he gives accounts of two methods, surface fishing with the aid of live bait to bring up the albacore and deep long-line fishing in so-called 'albacore holes'. His descriptions of the fish suggest two species in the modern classification, albacore *Thunnus alalunga*, (Bonaterre) and yellowfin tuna *Thunnus albacares* (Bonaterre).

While, because of the lack of information relating simple hook types to fishing methods noted by Anell (1955), no target species can be identified for the three hooks MA4101, MA4547 and MA4632, a general observation can be made about the first and third. Although very different they have common details in the projecting lug on each shank and the sharply incurved points. Nordhoff (1930) draws attention to the differing European and Oceanic methods of hooking the fish. With a barbed steel hook the fisherman tugs to set the hook into the fish's jaw, while with an incurved point and a line leading from the

opposite side of the shank from the lug, a steady pressure rotates the hook into a firm hold.

The wooden hook fragments are, by their size, parts of shark hooks of the Eastern Polynesian type, of the same general shape in Tahiti and Hawaii, but varying in detail. The Tahitian hook has a wooden point and a lug on the shank, while the Hawaiian hook has a bone point and a tapered shank. Shark fishing was practised widely and the simple technique of lowering a baited hook might be enhanced by using rattles made of shells or coconuts to attract the sharks. In Hawaii, shark fishing was a Royal sport and the hook was always baited with human flesh (Anell, 1955).

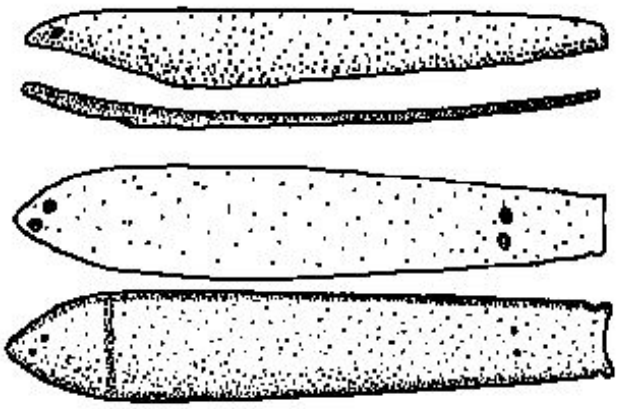

Figure 61. MA4091 and MA1567 juxtaposed.

The only references found to the possible use of a hook with a curved shell point such as that described above do not enter into any detail about the mode of fishing. One may surmise that the technique consisted of lowering the baited hook over the side of a boat, perhaps with a detachable sinker as was used in ruvettus fishing.

In general, hook and line fishing in Polynesia employed a hand-line, rarely a rod, and was done from a canoe in deep water. In shallower water such as the lagoon, an ancient method commonly used was to swim slowly around supported by a log and with the line in one hand (Danielsson, 1956). A last point on the subject of these simple hooks is that the bait was never impaled on the hook but tied on with a piece of string (Anell, 1955).

Discussion of the lures

Complete lures are classified by place of origin in the pages of Beasley (1928), Anell (1955) and others; by various characteristics such as the shape of the hook part; the type of lashing holding the components together; the sites of the holes for the lashings; the method of attachment of the snood; and, the organic materials used for cordage and tackle. These identifying features do not present themselves in this study, but a limited classification is possible.

Figure 62. Trolling lure (Forment, 1981).

Certain of the artefacts can be grouped as components of a particular type of lure in which the body was in two parts, a shaped piece of whale-bone faced with a thin slip of shell to provide the necessary attractive flash in the water. Serendipitously, an example can be provided from the artefacts. Figure 61 shows selected components in juxtaposition at the same scale and giving a reasonable match.

The large lures so formed were produced in Tonga (Beasley, 1928; Ewins, 1982), not only for local use but apparently for export to Fiji (Clunie, 1986) The drawing of the finished article (Fig. 62) is of a specimen in the Musées Royaux d'Art et d'Histoire, Brussels. It is catalogued as being from Tonga or Fiji and being composed of whale-bone, pearl shell, turtle-shell and plant fibre. It is 147 mm long.

Te Rangi Hiroa, writing about large trolling hooks in Samoa, reports the finding of a lure of the above type but casts doubt on the probability of its being of native Samoan manufacture (Hiroa, 1930). An illustration from those of the Oldman Collection shows six similar lures, all from Tonga (Oldman, 1953). In a description of the Fuller Collection of Pacific artefacts (Force & Force, 1971) it is stated that trolling hooks of this type are found only in Tonga. The James Hooper Collection also has a number of similar lures ascribed

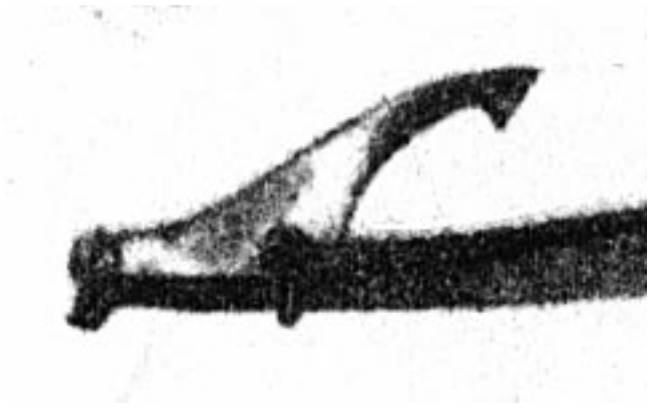

Figure 63. Tahitian lure point (after Beasley, 1928).

to Tonga (Phelps, 1976). Although Edwin Burrows bought such a hook in Uvea (Burrows, 1937), all the other hooks he encountered had shanks of pearl shell and the single example was probably imported. There can be little doubt that the bone and shell composite shank is peculiar to Tonga.

In the assemblage, there are five of the bone components of Tongan lures, MA 21, 690, 1550/1, 4091 and 4548 (Figs 1, 3, 11, 18, & 24). There are four of the facing slips of pearl shell, MA 762, 1550/2, 1550/3 and 1567 (Figs 4, 12, 13 & 14).

Nineteen of the artefacts are lure shanks made of shell and complete or nearly complete. MA157 is a small fragment, heavily concreted (Fig. 2). Discounting it, the sizes range from 38 mm to 116 mm. All but four fall into a length range of 70 to 93 mm, while the others are two small ones at 38 and 40 mm and two large at 111 and 116 mm. The shapes vary widely, but some grouping can be distinguished. Five are similarly formed into smooth streamlined shapes and sizes ranging from 76 to 93 mm. These are MA 1723, 4113, 4162, 4593 and 4736 (Figs 15, 20, 21, 31 & 39). The two largest are alike in that their shapes are similarly angular. The only discernible common factor in the others is the obvious one for the whole group. They are all figurative representations of small fish.

The five lures listed above correspond in form to a description given by Anell of Tahitian bonito lures (Anell, 1955), but he does state that they do not differ essentially from West Polynesian specimens. The single important find of a hook component of bone, MA4744 (Fig. 40), can be identified as Tahitian by its shape. It

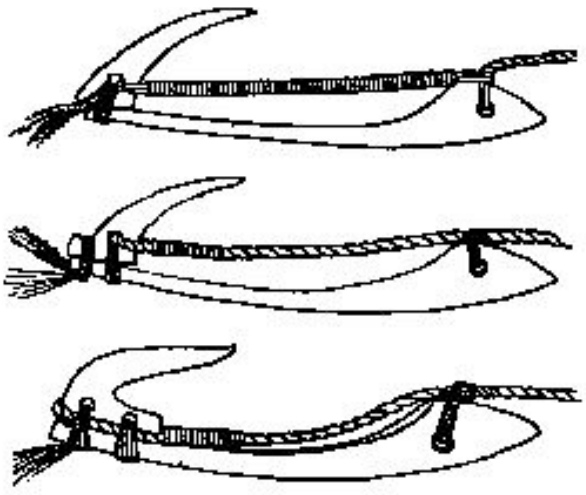

Figure 64. Bonito lure (after Anell, 1955).

is East Polynesian because of the prolongation of the base away from the point and it has one hole in contrast to the two holes of the Marquesan type. Beasley's plate LXVI (Beasley, 1926) shows a lure from Tahiti in which the similarity extends to the shape of the point. A detail from the plate is given in Figure 63.

Figure 65. Tahitian lure body shapes (after Beasley, 1928).

The available materials for hook points were bone, turtle entroplastron and shell, the last giving a rather brittle point. In Tahiti, according to Anell (1955), animal bone replaced the former use of bone from fallen enemies. While offering a last insult, it also provided a strong and workable material.

There are several possible reasons for the variation in shape of the pearl shell lure shanks. These are individualism on the part of the craftsman, limitations of the material, the projected use and regional variation. One need only look at the profusion of modern fishing lures offered for sale to realise that the search for the perfect lure has long been established.

Writing about traditional fishing in Tokelau, R.D. Gillett (1985) points out the significance of pearl shell as a valued material for fishing lures and other uses. In 1937, McGregor mentioned the diminution of the supply 'as succeeding generations comb the lagoon for the precious material' (McGregor, 1937). Maximum use must be made of a shell being cut into lure blanks.

Figure 66. Bonito lures (after Koch, 1965).

The two longest and thickest are those across the hinge, while outwards from there the blanks, and thus the lures, become progressively shorter and thinner. The shape of the lure determines its behaviour in the water as it is pulled along by a canoe or by hand. One with a sharp pointed head will tend to dive and a round-headed one will skip along the surface. The curvature in different planes makes the lure rotate, wiggle or dart about as desired. The variations in shape of the shell lure bodies in the assemblage make it plain that the ancient fishermen of Oceania understood very well the principles of lure design.

Regional differences in design, without the characteristics of hook points, methods of lashing the parts together and plant species providing the fibres for the cordage, are lost in the physical variability of the shell body required for different uses. This point is illustrated by Figure 64 which show three lures for the same target species, but from different locations. These are, from top to bottom, Hawaii, Tahiti and Manihiki. The presence of hooks and cordage is required for differentiation.

On the other hand, a drawing of the lure bodies only from an illustration of Tahitian lures in Figure 65 (Beasley, 1928), highlights the fact that they are all different. While some are quite similar to items in the assemblage this it somewhat short of proof of place of origin. Moving further afield into Micronesia in order to press the point, a illustration of bonito lures in the Gilbert Islands (Fig. 66) shows them to be very similar in shape to those of Polynesia. To sum up, apart from the Tongan lures, lure body shapes are too variable in one respect and too constant in another to allow places of origin to be ascribed to those in the assemblage.

The use of the larger lures in various locations is well documented from early days of European settlement through to the latter days (Ellis, 1832; Nordhoff, 1930; Handy, 1932; Burrows,1936; McGregor, 1937; Kirch & Dye, 1979; and Gillett, 1985). The descriptions of the tackle and technique remain consistent with each other until the time that canoes were superseded by aluminium skiffs with outboard motors. Employment of the lure for bonito fishing was practised across the Pacific from Papua New Guinea to Hawaii with variation in details of the tackle and lures. Charles Nordhoff (1930) believed that the Society Island lures reached the peak of design, construction and efficiency. William Ellis (1832) reported that the shell lures were considered better than any imported version. Long after the introduction of European equivalents, pearl shell lures were preferred and even the turtle shell point was thought better than a steel hook because it broke before the valuable shank.

The fullest account of Society Island fishing is that of Charles Nordhoff (1930) who was himself a keen sea-angler and accompanied the fishermen on many occasions. An almost as full description of fishing in the Ellice Islands was given by Donald Kennedy (1931).

Fishing for bonito (Gymnos*arda pelamys*) in the traditional fashion was an exciting sport demanding a high degree of skill to be an expert and exceptional stamina. The schools of bonito move quickly and erratically in pursuit of the shoals of fry (the young of many species) and their presence can be detected by sighting the flocks of birds also feeding on the fry. By the species and behaviour of the birds, the fisherman decided upon the chase. It took hard paddling to enter a school and the paddlers were not to be able to keep up for more than a few minutes. The aim was to boat the maximum number of fish in the available time and the tackle was designed for this purpose.

A light outrigger canoe carried the fisherman and crew, one paddler according to Nordhoff (1930), three in Kennedy's illustrations (1931). Along the cross-booms of the outrigger were carried several rods of the best bamboo about 3 m long. To each of these was tied three to five lures, chosen from a large collection, by lines stretching from the tip to just short of the butt, where the lures were secured in a netting sleeve. These lures had been selected for size and colour according to the time of year, the sea state, the quality of the light, the fry being fed upon and the intuition of the fisherman. On arrival in the school of fish, lures, deployed so that they skipped along the surface, were tried quickly and changed until the right one was found. Successive fish, weighing around 10 kg each, were then hooked and boated. 'A violent semi-circular wrench on the rod, which pulls the fish from the water and brings it flying aboard as though shot from a catapult' (Nordhoff, 1930) was the mark of an expert. While the novice had to use a sharp point to make sure of the fish, experts used blunt points and manipulated the fish out of the water and into the boat by line tension alone. What the Europeans called barbs on the points were to prevent penetration and

Figure 67. Octopus lures (Kaeppler, 1978).

Figure 68. Seeking the octopus.

slowing down of the unhooking. Masters of the craft flicked the fish off the lure and were fishing again before it had landed in the boat. Up to fifty bonito could be caught in a strenuous afternoon in this way.

The smaller lures could be used in various ways according to Anell with regard to Samoa (Anell, 1955). They could be thrown out and pulled back through the breakers or, attached to a rod, swept from side to side near the surface. This method was described by Gordon McGregor in his paper on the ethnology of Tokelau (McGregor, 1937) in which he also described a very small lure fished with rod and line off the edge of the reef on moonlit nights. A leisurely way to fish was to tie a small lure to a toe and paddle one's canoe gently along the reef.

Discussion of the octopus lures

The remaining artefacts can be shown to be parts of two separate types of specialised lure designed to attract octopus. In the simpler of the two, a stone sinker and a cowrie shell are tied together on to a wooden rod, which may or may not have a hook attached to the other end. The James Hooper collection has one, with a hook, recorded as originating in Hawaii (Phelps, 1976) It is 203 mm long. The securing cord passes through perforations in the shell corresponding to those in MA776 and MA777 (Figs 5 & 6). The plate (Fig. 67) shows specimens in Trinity College, Dublin.

In the other form, plates of cowrie shell are tied to a shaped stone, again with a wooden rod attached. The James Hooper collection has three of this type (Phelps, 1976). The first is described as: 'Octopus lure; two tiger-cowrie plates, one pierced, bound to conical lump of calcite with plaited coir; stick below'. The artefacts, MA778, MA4564, MA4590 and MA4665 (Figs 7, 26, 30 & 37), can all be regarded as parts of such lures. The last is a 'conical lump' of white stone and the others are perforated plates of cowrie shell suitable for attachment to this stone or similar stones. William Ellis describes a 'curious contrivance' of this type but omits mention of the stone sinker (Ellis, 1832).

At this point, one is left wondering about the design and origin of these strange lures. The technique was to dangle the lure over the side of a canoe in the right area and move it about slightly for the illusion of life. Why the octopus, which lives on fish, crabs and other small crustaceans and not cowries (Barnes, 1987), should embrace one remains something of a mystery. Samuel Manaiakalani Kanakau gives a romantic explanation for the attraction of the Hawaiian octopus after ascribing a female presence to the cowrie (Kanakau, 1976). Another story, prevalent from Tonga to Tahiti (Gibbings, 1949) depends upon the resemblance of the lure to a rat, presumably a rat in *rigor mortis*.

An explanation is still required on why an octopus should go for a rat, as their habitats are so dissimilar. Gibbings tells it as a fable, with a crab, a bird and a rat going for a sail in a coconut shell. When the shell sank, his companions were not discommoded, but the rat was left swimming for the distant shore. Given a lift by a friendly octopus, the rat, with loose bowels and no manners, behaved in a really unforgivable way towards the octopus. Since then, the octopus will attack without hesitation his mortal enemy, the rat.

The artefacts and their role in a living ship

Excavation of the wreck of *Pandora* is far from complete and it is quite probable that many more items of Oceanic fishing tackle will be recovered. Areas excavated to date are mainly confined to the after part of the ship. Figure 69 shows grid squares investigated from 1984, when the grid was established, to 1996. The hatched squares indicate those squares from which the artefacts forming the assemblage under discussion were recovered. The section of the intact vessel covered by the area of interest has three levels. On the upper deck it included the Captain's accommodation, on the lower deck, the wardroom or gunroom, as it was known in a frigate, with officers' cabins (Fig. 70) around and below these, the magazine and store-rooms.

When the sinking *Pandora* grounded on the sea-bed, it would appear that the hull rested on the keel and starboard bilge. Loose objects accumulated first on that side of any compartment and then fell lower and lower with the continuing disintegration of the exposed hull under the destructive influence of marine borers. Light items were swept away by the currents, while the heavier artefacts continued on their downward progress to their penultimate resting places under the sediment, in and around the remains of the hull. In theory, artefacts found in a particular part of the vessel could have been there at the time of the

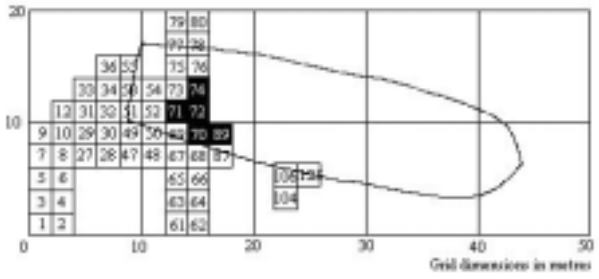

Figure 69. Area of recovery of the artefacts.

Figure 70. Isometric drawing showing the officers' quarters (after McKay and Coleman, 1992).

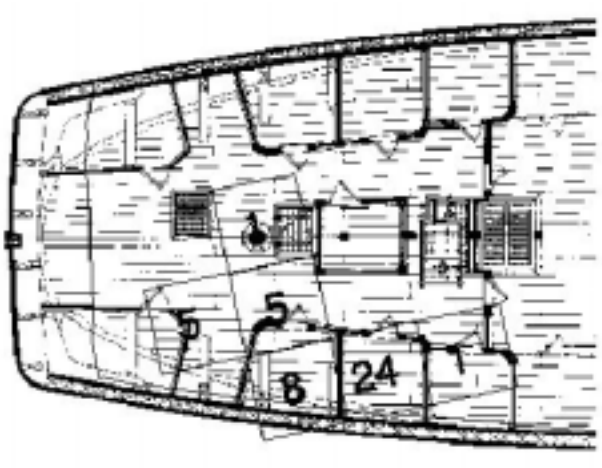

Figure 71. Part of the lower deck of HMS *Pandora* (after McKay and Coleman, 1992).

sinking or have arrived there from above and perhaps a starting place further towards the port side. Objects falling from the higher parts of the vessel such as the quarter-deck or Captain's cabin might be more likely to end up outside the remains of the hull.

Loose objects, originally together in a part of the intact ship would be subjected to a scattering influence due to the random nature of the disintegration of the structure during their downward passages. It could be postulated that a high concentration of artefacts of the same 'genus' indicates that, when found, they are close to their original situation. Uncovering of the top of the magazine bulkhead and the ship's side during the 1996 expedition made it possible to relate the grid to the topography of the ship. Grid square 89, excavation of which in 1996 doubled the size of the assemblage, lies over the outboard side of an officer's cabin on the lower deck. Figure 71 shows the result of overlaying part of the grid on a plan of the lower deck. The numbers in the squares indicate the numbers of artefacts recovered.

Presumably because they had more deck space than the others, the middle cabins on each side were allocated to the First Lieutenant and the Master, with the one on the starboard side to the First Lieutenant. The acquisition of 24 items of fishing tackle together with clubs, adzes, poi pounders and other objects of Polynesian origin from the First Lieutenant's cabin establishes him as the principal collector of artificial curiosities, so far. A not unreasonable surmise is that all, or most, of the officers collected some exotica. Captain Edwards included his artificial curiosities in his compensation claim for personal property.

All of the ship's company were at some time in contact with island people, with the opportunity to procure local products, according to their inclination, resources and stowage space on board. This last consideration leads to what might be termed the hierarchy of allocated space, which paralleled rank, power and, incidentally, the division of prize money. The Captain, as supreme authority on board, resided in enclosed compartments covering about a sixth of the upper deck. He also had his own store down below. Under the Captain's accommodation, a slightly larger space held the gunroom and cabins for six officers. An officers' storeroom, about half the size of that of the Captain, was next door to it down below. The only space a midshipman had to call his own was inside his chest. Ratings in frigates were better off than those in ships of the line in that each man had, in addition to his kit bag, a share of a chest, because there was more room on the lower deck (Lavery, 1989). The senior ratings or warrant officers, such as the carpenter and the gunner, who each had charge of a compartment containing ship's stores, indubitably had some latitude regarding spare space. William Richardson, on taking up his position as gunner of HMS *Tromp* (54 guns) in

Figure 72. Detail from a Parkinson drawing [after Parkinson, Carr (ed.) 1983].

1800, complained about the amount of personal gear that he and other warrant officers had to move from ship to ship (Richardson, 1970 [1908]).

On detached duty, away from home or a fleet with its supervision by the Admiral, the Captain had absolute authority over the ship and its people. This authority was not arbitrary but defined by his orders from the Admiralty and by Naval Regulations. He determined not only the discipline and work of the ship but the visible attitudes of the officers towards their men.

The divisional system, which still exists in much the same form today, was introduced in 1775. Each lieutenant, with the aid of one or more midshipmen, was given the responsibility of seeing that the men in his division, part of the ship's company defined by name, were clean, healthy and fit for duty. It meant that the officers came to know their men better and to pay more attention to welfare. The First Lieutenant, without a division of his own, was overseer of the system. Minor punishments, such as extra duties, could be awarded by the divisional officer, greater ones by the First Lieutenant and the maximum permissible by the Captain.

'In eighteenth-century England social distinctions were taken as a matter of course; the principle of subordination was regarded as part of the natural order of things: but relations between the classes were usually friendly' (Marcus, 1975). A smallish ship like a 24-gun frigate might be compared with a village community ashore, putting the captain into the role of squire or lord of the manor and establishing from there a similar system of social strata. In such a floating village, anyone is free to talk to anyone else, showing proper respect when necessary. Depending on personalities, likes and dislikes would have formed, friendly feelings or otherwise felt and constrained by the bounds of the social system. Common interest in maritime affairs and a common language made all ranks much more at ease with each other than many an officer must have felt when propelled into a Society drawing room. Lord St Vincent, at an advanced age, was buttonholed at Greenwich by four equally elderly pensioners. 'The Admiral and his former shipmates continued in close conversation for upwards of an hour, to their mutual satisfaction. "We all in our day" St Vincent remarked in parting, "were smart fellows"' (Marcus, 1975).

In keeping with the times, when theft ashore was still punishable by hanging, disciplinary measures at sea were severe. This, however, has not generally emerged as grounds for complaint. The complaints of Jack Nastyface, whose real name was William Robinson and who eventually deserted, were cruelty and impressment (Robinson, 1973 [1836]). The lower deck contention was that disciplinary measures should be just and reasonable, not excessive and capricious. C.R. Pemberton, who wrote under the pseudonym 'Pel Verjuice', while praising his own commanding officer, pointed the finger at what he called 'vexatious niggling discipline' (Pemberton, 1929). There were captains who inflicted brutal punishments, presumably without entering them in the log as required by the regulations, but it has been suggested that the harshness of the system has been much exaggerated (Marcus, 1975). Flogging, for offences which nowadays would put a man in cells, was limited by the regulations to twelve strokes unless by the order of a court-martial, at a time when corporal punishment was normal practice ashore and flogging in the Army was much more extensive. Captains detected in brutal practices were quickly dealt with by the Flag Officer, like Captain Lord William Hervey who was dismissed from the Navy in 1742 (Lloyd, 1968). In an analysis of the mutiny of the *Bounty*, the reason for *Pandora*'s presence, Greg Dening (1992) points out that Captain Bligh awarded fewer men with corporal punishment than did Captain Cook, against whom there were no complaints in that respect.

Sailors did and still do prefer discipline to be strict and fair; to serve in a 'taut ship'. Knowing where they were in that respect, *Pandora*'s people could in other respects have been their own men. It is likely that if they wished to trade with the islanders, they were generally free to do so.

While opportunities to trade for artefacts were available to all and unequal restrictions followed the inequalities of rank, pay and living conditions, no arbitrary rules could be applied from a position of power. As stated above, the supreme authority of the Captain had its constraints. Captain Edwards' reports (Edwards & Hamilton, 1915) do not mention the subject so that it is necessary to turn to Captain Cook's journal of the first voyage (Cook, 1893). On arrival at Tahiti, Captain Cook saw fit to make rules for 'Traficking with the Natives' and these are reproduced in his journal. They are confined to control of the trade for provisions and confinement of the exchange

of ship's stores for provisions only. Later he had to act to stop the sailors from pulling nails out of the ship to be offered in exchange for the favours of the local ladies. On the day of arrival at Tongtapu Captain Cook prohibited the purchase of curiosities to prevent interference with the buying of provisions (Beaglehole, 1961), but next day free trading was allowed (Hoare, 1982).

Johann Reinhold Forster, principal scientist on Cook's second voyage, complained bitterly about sailors buying curiosities and pushing up the price (Hoare, 1982). An outburst in his journal was triggered by an offer of six shells with an asking price of half a gallon of brandy! He noted that the Gunner and the Carpenter had several thousand shells and it is clear that there was trade between members of the crew as well as with people ashore. If a Captain less fair-minded than Cook had acted to confine the trade to favoured individuals, he would soon have had a deputation at his door. There is no evidence that Captain Edwards, an unimaginative martinet perhaps, was not fair-minded. His strict adherence to orders and regulations would tend to indicate the contrary and if he had issued any orders restricting trade the fact likely would have been recorded.

Can it then be assumed that interested members of *Pandora*'s crew were, within the limits of their personal resources, trading for curiosities with the Polynesians and among themselves? Once the sailors had discovered that the First Lieutenant was a collector, those with an aptitude for such business would have been bringing him a succession of offerings for sale. Others with some space for storage would have been making collections of their own for the better prices in England. Further excavation of the wreck is likely to produce many more items originating in Polynesia. If the Captain had a good collection it is to be hoped that it was put in his store rather than in his cabin. Jeremy Bentham, the Purser, was a known associate of Sir Joseph Banks so that he may well have received an authoritative briefing on what he should bring home. His cabin was the forward one on the port side, yet to be excavated at the time of writing.

The participants in the exchange

The British visitors and their islander hosts were worlds apart culturally, to the extent that they were probably alternately amused and scandalised by the behaviour of the other side. Unwitting social blunders could become serious such as the occasion during Cook's second expedition, when a boat's crew from *Adventure* was massacred in New Zealand for infringing a taboo (Beaglehole, 1961).

While the island populations had, from their common ancestry, general similarities of culture, post-diaspora isolation led to many differences between the islands. Te Rangi Hiroa warned against assuming a general pattern in his paper on Polynesian anthropology (Hiroa, 1945). The customs of interest in this instance are those relating to the rules of hospitality and intercourse with visitors. Notwithstanding Hiroa's caution, trading contacts and political treaties between communities appear to have established general rules of hospitality, including the exchange of gifts (Oliver, 1989). As in Saudi Arabia, where verbal admiration of an object is in the expectation of being given it, a Polynesian visitor appeared to be at liberty to ask for items of the host's property. Nordhoff (1930) wrote that one did not exhibit one's best fishing lures for fear of losing them in this way.

Presents were not only exchanged between host and visitor, but given as a mark of friendship when a return gift was not expected and would be refused at that time. Both circumstances can be illustrated from J.R. Forster's journal: 'The first Man that came on board was presented by me with a small Nail & a few beads; he took immediately a fine Mother of Pearl Fishhook & gave it to me' (Hoare, 1982). Secondly:

> There came my friend *Owahow* & brought me a good many Plantains, Breadfruit, some fish, & two or three good *Ahoos* & some fishing hooks; after which I offered him a large knife, & several large Nails; but he refused them, saying he brought them things for friendship (Hoare, 1982).

Trading seems to have been what trading was and is the world over, bargaining to achieve the 'best price'.

The value of fish-hooks and lures as gift or objects for trade was determined to some extent by the amount of work involved in their production. To those of pearl shell in particular there must be added the intrinsic worth of the material. Unworked pearl shell was a valuable commodity and possibly a diminishing resource. It could only be obtained by diving so that its acquisition was both labour intensive and dangerous. In some islands without the necessary marine environment, it had to be imported. Being such an attractive material, there was competition for its use. Carefully crafted into a bonito lure, it became a visually pleasing object of considerable value and a gift of some status.

A lure which had been used for some time, had been named by the owner and had caught many fish, thereby acquiring a large charge of *mana*, was much more valuable and probably not for sale. To a friend who knew its reputation, it would be a prestigious gift. Old and successful lures became priceless family heirlooms, never to be given away or sold, and never shown to visitors to prevent them being requested as gifts (Nordhoff, 1930). According to Nordhoff, many of the lures in museums would be useless for fishing

because the points are badly shaped and the shanks that he had seen in the hands of collectors were 'equally worthless'.

The other protagonists in the exchange, *Pandora*'s people, carried with them the attitudes and mores of Georgian Britain. The education of the ratings had been rudimentary in most; literacy was required of only the senior ratings. The education of the officers from the age of twelve or thirteen had been solely directed towards professional knowledge. It produced superb seamen and navigators, but left the gathering of knowledge in other fields to personal inclination. The application of enquiring minds ashore to the acquisition of information about other peoples and societies which was part of the English Enlightenment may have inspired some naval officers via their individual social circles ashore. Most of them, one might suspect, did not move in that sort of social circle. Others, because of the naval connections of Sir Joseph Banks, may have learned from him or his circle something of the keen scientific interest in studying the cultures of the peoples of the Pacific (Gascoigne, 1994). In spite of falling out with the Admiralty Board before Cook's second voyage, Banks had maintained a close contact with the Navy and had continued as their principal adviser on voyages of exploration (Mackay, 1985).

It has been pointed out that, following the publicity given to Cook's voyages, the natural history and peoples of the Pacific became better known to European scientists than those of regions nearer home (Smith, 1985). Once the intention for a voyage such as that of *Pandora* had been made public it is likely that her personnel would have been sought by scientists and collectors with both general and specific requests. With patronage such a strong factor in the pursuit of advancement in and out of the Navy, a shrewd officer would make a careful selection of whose requests he would consider. As a *quid pro quo* for the procurement of natural or artificial curiosities he could then expect some influence on his behalf to be exerted in the corridors, or perhaps the drawing-rooms, of power.

For both officers and ratings for whom patronage was not a factor, there remained the commercial advantages of bringing back curiosities to a growing and increasingly competitive market. At the time of Cook's first voyage, the main interest was in the natural history of these little known places. The remarkable variety of artefacts brought back from the Cook voyages stimulated the desires of scientists and collectors alike to produce a sellers' market. The publicity given to drawings and paintings of the artefacts, the people and their surroundings by Parkinson, Hodges and Webber served to increase interest. Figure 72 is a detail from an engraving of a Sydney Parkinson drawing entitled, 'Various Instruments, & Utensils of the Natives of Otaheiti & of the adjacent Islands' (Carr, 1983).

Articles which could be procured in exchange for cloth, beads, nails or edged tools commanded high prices at home. Any keen member of the crew with stowage space for a collection could look forward to a welcome supplement to his income on return to his home port. Businessmen among the sailors without the storage capacity aboard had to make what they could by acting as middlemen or primary collectors between the sellers and those putting away curiosities for sale in Britain. Nicholas Thomas observed that, although the European view was that there was an intense desire for iron, 'it is apparent from specific accounts of bartering that the islanders did not in fact value iron to such an extent that they would surrender their own valuable property for it' (Thomas, 1991). Putting this together with Nordhoff's opinion of the lures held by museums and collectors makes one wonder how early the production of 'tourist quality' artefacts started.

A motivation towards personal collecting is that of the evidence of a display of curiosities in one's own home of travel and experience abroad, visible proof of completion of the voyage. It is exemplified by a portrait of Sir Joseph Banks in which he stands surrounded by his trophies. Nicholas Thomas discusses this aspect, but only after writing:

> The interests of the common sailors in specimens—whether shells or artifacts—were motivated merely by capricious passions and a base desire for financial advantage (Thomas, 1991).

This is much too dismissive. In modern times, artefacts from places visited are both personal reminders of experiences abroad and visible proof of having been in exotic places. Eighteenth-century travellers, whether abroad on duty or by personal inclination, are likely to have had the same motivations irrespective of rank or status, strengthened by the fact that they had visited places which few of their contemporaries could see. Acquisition of a personal collection could, of course, be combined with collecting for others or for commercial reasons.

The collecting strategies may have differed somewhat between officers and ratings. The officers, who would have been the first to be approached by scientists and collectors through social contacts before leaving England, might have been briefed to take a structured approach towards obtaining representative samples of the artefacts from the communities visited. Those sailors who had considered the commercial possibilities before leaving would have checked their likely markets and formed their ideas on maximising profits. The senior ratings had the advantage in this respect with better opportunities in England and more storage space. We can be sure that the Carpenter and Gunner of *Resolution* had their reasons for collecting

several thousand shells (Hoare, 1982). As for the items for personal retention, the visitor abroad, whether from the upper or lower deck, would have selected artefacts which were attractive to his eye and which perhaps would have some dramatic effect when displayed at home. It could be assumed that the aesthetic sensibilities of the officers were on a higher plane than those of the sailors, but it is possibly unfair to presume that the officers' tastes were invariably less eclectic than those of the ratings.

Only the First Lieutenant, Lt John Larkan, has been positively recognised as a collector so far. Excavation of the Captain's store-room may prove to be very interesting in this respect. Without an investigation of Larkan's personal correspondence the reason for his accumulation of a considerable collection of Polynesian artefacts must remain unknown. The items of fishing tackle formed only a small proportion of the total. The total number of Polynesian artefacts has yet to be counted and classified, but the best estimate for the proportion of fishing tackle artefacts is 15% (Gesner, P., 1996, pers. comm.)

Who else purchased curiosities? Trying to identify with any member of *Pandora*'s crew in that situation makes one suspect that anyone with anything to barter would have acquired something to take home.

Artificial curiosities

The survivors of the wreck of HMS *Pandora* had perforce to leave their belongings behind but what were the long-term effects of collecting? The many Pacific artefacts which did reach their destinations are now scattered through many museums and private collections. Most are representatives of objects that do not now exist elsewhere other than in collections except as debased tourist souvenirs. A possible exception is that of the treasured pearl shell lures still hidden away as priceless family heirlooms.

Fishing tackle in use today is wholly modern except perhaps in a technological backwater here and there. The local production was under siege early, for Magellan carried fish-hooks as trade goods (Beaglehole, 1966). The list of articles for bartering carried aboard HMS *Porpoise* in 1802 included fish-hooks among various items of tools, nails, haberdashery, clothing and arms (Maude, 1968). Captain Peter Dillon in his quest to find the fate of Lapérouse's expedition distributed fish-hooks with other goods in the hope of receiving information (Dillon, 1829). The attack was resisted well beyond the 1930s when Nordhoff (1930) and Kennedy (1931) both reported continuing use of the traditional lures. Gillett (1985), writing about Tokelau, described the pearl shell lure as 'the most essential item of gear for skipjack fishing'.

The modern steel hook is a much more efficient fishing implement than its predecessors of shell, wood and stone. Shaped to be efficient when applied to Polynesian fishing methods it is now in general use. The bait attracts the fish, while a good hook ensures its capture. The situation may be quite different with lures which have to combine the functions of attraction and capture. If fishermen have found that the pearl shell lure is more attractive to the fish than its modern rivals, one can be sure that it is still in use. A pearl shell shank could be combined with a steel hook and synthetic line. It would be an interesting study to investigate the survival of this use of pearl shell.

Conclusion

In the course of reviewing these Polynesian fishing implements three main groups have been distinguished—fish-hooks, fish lures and octopus lures. Within the basic restriction of form determined by function, the few hooks in the assemblage show wide variations in size and shape, reflecting the even wider variations found in the museum collections. This plasticity in form of what could be regarded as a simple instrument, requiring only to be manufactured in different sizes, has several origins.

For the Polynesian craftsman, the first factor influencing the shape of the hook was the material. The strength determined the thickness of the finished hook and ease of working, the amount of shaping and finishing. Other factors acted upon the shaping and finishing. In the way that many fishing flies are designed to attract fishermen rather than fish, the product had to have aesthetic appeal, first to the maker and then to the user. This consideration would be important to a craftsman making hooks for sale, when tradition would play its part in setting the aesthetic standards. Lastly, as well as being the right size for intended fish, the shape of the hook was influenced by the feeding habits of those fish with regard to giving a maximum probability of capture.

Modern lures are designed to give the impression of the presence of a small fish. Lures have been made to look like fish, but it has been found that movement, vibration, flash and colour are much more important than accurate representation. Many different shapes and colours are produced, all with the aim of being deadly. A similarly wide variation in shape exists among the lure bodies in the assemblage. The range of shapes and the evidence of the importance attached by the fisherman to colour and sparkle, together make it clear that the Polynesian fisherman of old had a thoroughly modern approach towards the use of the correct lure for the occasion.

The two types of octopus lure present are essentially similar in form and physical shape. The components of both are sinkers, cowrie shells and wooden rods. The same general effect is produced whether whole

cowries are tied on to the sinker or cut into plates to be fastened around it. The single functional difference is that one type incorporates a spike or hook for impalement of the cephalopod. The marked similarity points to the common ancestry of the makers and the relatively minor differences to a subsequent period of separation.

Provenance, especially with regard to the place of origin, is of the utmost importance to the collector of artefacts. From the scientific point of view it is doubtful whether any useful information could be adduced without that starting point. Modern tourists often find on closer inspection that their local souvenirs were imported from some distant place, a potential pitfall that collectors have always faced. Those of *Pandora*'s people who had been engaged by experienced collectors in England must surely have had some instruction on this point and its effect upon their collecting strategies. Those whose interest was commercial would realise early that provenance was important to price.

In discussion above, it has been found that the items of fishing tackle differ from place to place of origin for various reasons and that it is possible to identify regional characteristics in intact specimens. There is, however, the reservation that those who have made studies of these characteristics not infrequently disagree (Skinner, 1942) or express doubt (Beasley, 1928). We now know that fishing tackle was traded between islands, for example, that the large Tongan composite lures were exported to Samoa and that pearl shell was exchanged between islands in order to give the fishermen a variety of colours. Information such as this was only beginning to be collected at the time of *Pandora*'s voyage. The knowledge that the fishing lure being offered for barter had been fabricated locally from imported pearl shell would have had to be imparted from seller to buyer at the time. Initial information about provenance depended on the honesty and willingness to talk of the seller, assuming he could be understood by the buyer.

While many items must have been taken at face value and ascribed, correctly in most cases, as originating at the place of sale, the more discerning of the Naval purchasers must have developed collecting strategies, particularly for the true identification of place of manufacture. Development of such a strategy would quickly pass obvious details such as elimination of items made from material not appearing to be found locally. Employment of an interpreter to aid in close questioning of the seller would be a step in the right direction, but the retrospective advice of the writer to his Naval predecessors would be to cut out the middleman, find the craftsman at work and eliminate all doubt.

Finally, how may the significance of the assemblage be assessed? It is from a period early in the history of the collection of artificial curiosities, at the time of an explosion of interest stimulated by the artefacts, accounts and illustrations of the Cook voyages. The same explosion of interest had a major effect on the growth of the infant science of anthropology. Sir Joseph Banks stands out as the link between Polynesian artefacts and anthropology (Gascoigne, 1994) Not only in Britain was the interest apparent, the instructions given to Lapérouse about observation of inhabitants (La Pérouse, 1798 Milet-Mureau trans. ?) were much more detailed than those given to Cook (Cook & King, 1784).

The assemblage is representative of a collection which has remained intact apart from the taphonomic processes occurring since *Pandora* sank. Museum collections may include intact specimens of the composite items, but they have been subjected to the filtration processes of time and human selection. These artefacts were initially brought together as the result of the contact between two ethnic groups of people during a specific and well-documented historical period of contact. In contrast to the many voyages of discovery, productive of a profusion of artefacts which were then distributed somewhat haphazardly, this assemblage is perhaps unique as an example of the original associations of artefacts in their collection state.

This discourse, in common with so many others, has probably raised more questions than it has answered. The opinion has been stated that it is likely that nearly everyone on board was engaged to some extent in the acquisition of Polynesian artefacts. The proof of this assertion is dependent upon the continuing excavation of the wreck. There are likely candidates to be major collectors such as Jeremy Bentham, the Purser, a known associate of Sir Joseph Banks. It would be interesting to uncover historical evidence of contacts between collectors in England and *Pandora*'s people. Away from preoccupation with fishing implements, some light would be thrown on collecting strategies should a study of the range and variety of Oceanic artefacts show any indications of a structured approach. The research project now most attractive to the writer is an investigation into the survival of pearl shell lures in Oceania and a comparison of their effectiveness against modern equivalents.

With the expectation that further excavation will continue to be productive of Polynesian artefacts, it may be assumed that the assemblage of fishing implements will grow into a major resource for maritime and historical archaeology.

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Cultural contact along the Coorong in South Australia

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Figure 1. The Murray Mouth, Younghusband Peninsula (Karangk) and the Lagoon of the Coorong. Photo: B. Jeffery, 1998.

Introduction

This paper looks at some evidence of cultural contact along the Coorong, from the region's first inhabitants the Ngarrindjeri, to the 19th-century European explorers and shipwreck survivors. The Coorong, located in the south-east of South Australia, was selected as an example of this contact as it is a remote and relatively undisturbed region known to contain sites, and documentary evidence which could illustrate this contact. It could be seen as representative of the contact in South Australia, or it may not, this was not the intention of the paper. Other studies have looked at other regions of South Australia, for instance, the contact on the west coast of South Australia has been considered by Arnott (2000).

One of the purposes of this paper was to provide some South Australian input into the Australian Contact Shipwrecks Program (McCarthy, *et al.,* 2000: 133) which has as its aims the development of a 'stage one' in a range of 'contact studies' which would 'provide the cornerstone for more broad-reaching studies by historians, archaeologists, anthropologists, regional Aboriginal academics and historians'.

This paper summarise some of the anthropological, archaeological and cultural heritage management work carried out along the Coorong, and the subsequent interpretation of an aspect of the region's heritage, the shipwrecks.

Location and natural history

The Coorong consists of a long shallow saline lagoon of up to 4 km wide and about 100 km in length, stretching from the Murray Mouth in the north, to its southern extremity, 45 km north of present day Kingston (Fig. 1). The western side of the lagoon is separated from the sea by a peninsula (up to 2 km in some places) containing well-vegetated and highly mobile sand dunes and blowouts. The Ngarrindjeri (the region's indigenous inhabitants) called this peninsula Karangk, meaning long neck, and is the Aboriginal word used for the general Coorong area. Europeans called the peninsula Younghusband Peninsula, after the British Home Secretary at the time South Australia was colonised in 1836.

A mobile and young foredune on the western side of the Peninsula provides 'the stability for the whole dune system' (Kluske, 1996: 16). On the eastern side of the lagoon a composite range of Pleistocene dunes exist. Younghusband Peninsula formed during the period 20 000 to 6 000 when the sea attained its present level. The lagoon between the older dunes in the east, and the recent dunes in the west was originally opened to the sea at its northern and southern extremities until about 2–3 000 ago (Kluske, 1996: 15). At about this time the southern entrance closed, and since then a series of isolated lakes have formed. The present lagoon is divided into a northern and southern section by an area called the Narrows (about 60 km from its northern end, the Murray Mouth), and together with other areas of low water would have enabled the Ngarrindjeri to walk across the lagoon to reach the ocean beach (Fig. 2).

Fresh groundwater soaks can be found at the base of the east and west sides of the sand dunes on Younghusband Peninsula. In addition fresh water from the River Murray and some creeks flow into the northern section of the lagoon. From 1940, when barrages were constructed to maintain fresh water in the northern lakes of Alexandrina

Figure 2. The location of the Coorong.

and Albert, the flow of fresh water into the lagoon from the Murray was restricted to times of substantial quantities.

Over 200 species of birds (some migratory) have been recorded in the region, which includes a large and diverse waterfowl and wader population. Twenty-three terrestrial mammals have been recorded there. Ten species of marine mammals have been stranded on Younghusband Peninsula. Twenty-one reptiles and seven amphibians exist there. It also contains 278 terrestrial flowering plant and fern species, and five species of fish (Kluske, 1996: 124). Given the diverse nature and quantity of flora and fauna, the Coorong has been recognised as an internationally significant wetland area. It was proclaimed as a National Park in 1966 under the South Australian *National Parks and Wildlife Act*; placed on an international list in regard to its significance as a waterfowl habitat; and subject to agreements with Japan and China on the protection of migratory waterfowl (Kluske, 1996:4)

Aboriginal occupation

Information about the region's first inhabitants comes primarily from Taplin (1879), but also from Jenkin (1985), Tindale (1974, 1981) Tolmer (1882) and Kluske (1996). Taplin lived in the area for twenty years (1859–1879) and 'had a personal knowledge of three-fourths of the natives' He resided at Point McLeay on the southern shores of Lake Alexandrina as Missionary to the Aborigines (Taplin, 1879: 34). It has been reported that Aboriginal people were known to have lived in this region for over 300 generations (Kluske, 1996:1). They were called Narrinyeri (now referred to as Ngarrindjeri), although they were originally called Tanganekald (Tindale, 1974). Taplin (1879: 33) reported that:

> The Narrinyeri are one of the most important tribes of aborigines in South Australia. They possess greater vitality than any other tribe that we know of. There is also amongst them indications of a form of organized society, law, and government, of a higher character than is usually found amongst Australian aborigines.

The Ngarrendjeri people were made up of eighteen clans that occupied areas from around present day Encounter Bay (as far west as Cape Jervis) down to Lacapede Bay in the south. It was estimated by Taplin (1879: 43) that in 1849, there were 2 000 Ngarrendjeri people, and in 1842 that there were 3 200 Ngarrendjeri occupying this region. In 1874, a total of only 511 were recorded (Taplin, 1879: 42-43). The clans that occupied the Coorong 'in the early days of the colony [European settlement began in South Australia in 1836] were known as the Milmenroora [now called Milmenrura]'. At the time of Taplin's presence in the region, the Coorong clans were called Milmenyerian (1879: 34). Taplin (1879: 43) estimated that in 1874 there were 114 men, women and children in the Coorong clan, stating that:

> I am sure everyone will feel sorry about this [the deaths of so many Ngarrindjeri]. We have deprived the natives of their country, sadly diminished their means of subsistence, and introduced a state of things more fatal to them that the barbarism in which they lived before.

He goes on to say that:

> My observations have led me to the following views of the principal disease from which the natives suffer, which is evidently tuberculosis in its different forms (Taplin 1879: 44).

Included in the work Taplin (1879) edited of the Ngarrindjeri's manners, customs and languages were some detailed personal observations. While it may be improper to take out of context isolated aspects of his writings on the Ngarrindjeri, for the sake of this paper—which is concerned with evidences of cultural contact (which includes migration)—it was thought appropriate to include the following observation by Taplin (1879: 39):

> It seems to be very probable that the Narrinyeri are a mixture of two races. Most likely the tribe which came with Nurunderi [their god who came down the Darling River to the River Murray and the Coorong where he 'slew a chief before going to heaven'] were of Eastern Polynesian race, derived from some people who may have been drifted in canoes on the north-eastern coast of Australia from the South Sea Islands. They discovered that there was a tribe already in possession of portions of the country, which

> seems Papuan. It is a fact that some of the Narrinyeri are straight-haired and of a lighter complexion, while others are curly-haired and very black. All the native traditions agree with the above theory. No doubt the Narrinyeri descended from a more civilised state of society. They possess laws, customs, implements, and weapons which they are quite unable to invent now, and elaborate ceremonies of which they do not know the meaning, although they adhere to them strictly.

As part of his observations and documentation of Aboriginal languages, Taplin (1879: 154–155) believed that there were similarities with Eastern Polynesian languages. He cites a number of words used by the Ngarrindjeri, including the widely used Australian Aboriginal word for water, '*appa*' and '*awie*' having very similar sounds in the Tahitian language and languages from other parts of Polynesia. His explanation for this is (1879: 154):

> The writer believes that this continent has been peopled by Aborigines through several streams of immigration, from different sources. One stream probably from the east coast down the Darling and Murray; another source across the continent, by way of the great depression, the Gulf of Carpentaria; and a third round by the western coast to Swan River and King George's Sound. Probably these streams of immigration were not synchronous. Very likely the country may have been occupied by first comers before others arrived. For instance, the tribes which came across the continent, probably reached Lake Alexandrina a long time before the immigrants arrived down the Darling; now although it is impossible with certainty to follow the track of these streams, yet one could arrange the languages in accordance with a theory of their probable course.

An intention of this paper was to look at all the evidence that exists in the Coorong as to the contact of cultures, commencing with the Aboriginal immigration. A cursory look at this issue has suggested through the observations of Taplin (1879) that various waves of Aboriginal migration from the north and offshore reached the Coorong. McEvedy (1998: 6–7) supports the view that early migrations to Australia and in particular to the southern latitudes were possibly from the Indo-Pacific region. In a recent study of mtDNA analysis of 455 people from Micronesia, it was found that 'the next closest degree of [mtDNA] similarity to the Marianas sample is Japan, then the aboriginal Australians, then a sample from Java' (Lum & Heathcote, 1998).

There has been considerable discussion amongst archaeologists about the routes taken by the early migrants into Australia, one such route proposed by Flood (1983: 35) was 'via New Guinea or the Aru Islands on to the central or north-eastern coast of Australia'. Tindale (1981, in Flood 1983: 79) 'believes that initial migration penetrated southwards on both sides of the Dividing Range'. There would seem to be some support for Taplin's view of 1879 that there were different places of entry for the early migrants to Australia, and in particular incorporating the east coast, although as Flood (1983: 79) points out 'present archaeological evidence does not support this'.

Figure 3. Sand dunes on Younghusband Peninsula, the areas in white are shell middens. Photo: B. Jeffery, 1998.

Today, the Coorong, primarily Younghusband Peninsula, contains in excess of 6 000 middens (comprising shell, bone and fire hearths) related to Aboriginal occupation, exploitation and use of the region from about 5 600 to the 19th century (Kluske, 1996: 34–35) (Fig. 3).

European discoveries and settlement

While the Dutch made observations of the western parts of present day South Australia in 1627, and the French through d'Entrecasteaux (1792) observed the west coast, it was not until 1800, through the British explorer, Lieutenant Grant aboard the *Lady Nelson*, that the coast around the Coorong was sighted. Grant's first landfall sailing from the west was the area south-east of the Coorong (around present day Robe) and he would probably have avoided the high energy seas adjacent to the Younghusband Peninsula. In 1802, Nicolas Baudin aboard *Géographe* was the first to explore the section of the coast including the Coorong stating that 'it is merely composed of sand dunes...and the sea breaks all along the coast with extraordinary violence' (Kluske, 1996:38). Baudin sailed further west where he met Matthew Flinders in April 1802, (now called Encounter Bay).

It was also known that American sealers where in the general vicinity of the Coorong, as is evidenced by the crew of the *Union*, who wintered on Kangaroo Island in 1803, during which time they constructed a 30-ton vessel and named it *Independence*. While no Aboriginal people occupied Kangaroo Island at this time, the island soon became a haven for escaped criminals and sealers who brought with them kidnapped Aboriginal women from Tasmania and 'the Murray Mouth-Encounter Bay [Ngarrindjeri] tribes' gaining the reputation 'as the most

Name	Description	Date wrecked	Where wrecked	Voyage	Cargo	Contact with Aboriginals
Fanny	23-ton, two-masted schooner	21.6.1838	50 km SE of Encounter Bay	Tasmania to Western Australia	Mail and Passengers	Friendly. Stayed with Aboriginal group for seven weeks.
Maria	135-ton, two-masted brigantine	June/July 1840	Unknown - Margaret Brock Reef	Port Adelaide to Hobart	Passengers	Crew and passengers (26) killed by Aboriginals.
St Vincent	11-ton, single-masted cutter	September 1844	Murray Mouth	Encounter Bay to ?	Whale oil	Unknown
Sophia Jane	15-ton, single-masted cutter	September 1844	90 km SE of Murray Mouth	Kangaroo Island to Port Adelaide	Oil	Unknown contact - no survivors.
Mariner	46-ton, two-masted schooner	7.11.1845	60 km SE of Murray Mouth	Victoria to South Australia	General Cargo and Passengers	Aboriginal group threatening survivors.
Gazelle	17-ton, two-masted schooner	September 1848	1 km SE of Murray Mouth	Unknown	Unknown	Unknown
Mozambique	399-ton, three-masted ship	21.8.1854	48-96 km SE of Murray Mouth	Western Australia to ?	Passengers	Unknown
Halcyon	192-ton, two-masted brig	1857	10 km south of Murray Moth	Adelaide to Melbourne	?	Unknown
Adelaide	63-ton, two-masted ketch	24.8.1874	50 km north of Lacepede Bay	Tasmania to South Australia	Potatoes	Unknown

Table 1. Shipwrecks along the Coorong from 1838 to 1874. [After Clark (1990) and South Australian Shipwreck Database at Heritage SA.]

vicious place in the British Empire' (Dallwitz, 1991 in McKinnon, 1993).

In 1831, Captain Barker was directed by the British Government to examine the mouth of the River Murray following on from Captain Charles Sturt's trip down the river in 1829–1830 and his glowing account of it. Sturt failed to reach the mouth and during Barker's investigations of it, he was allegedly speared and killed by Aboriginal people after swimming across the mouth to the northern end of Younghusband Peninsula. Barker's death and the fact that the Murray Mouth and the southern coast is a lee shore for sailing vessels, gave the area a feared reputation thereafter (Parsons, 1986). This was confirmed by the South Australian colony's first Harbour-Master and Naval Officer, Captain Thomas Lipson in his 1853 official set of sailing instructions (Sexton, 1986):

> The prevailing winds are from the south and west, a continual swell sets on the coast; which together with a great unevenness of soundings, cause such an irregular sea, that in the event of a vessel being obliged to carry off the land, the strain and tear would be awful.

On shore, European expansion into the Coorong region commenced from 1839 when the first stock were brought from the eastern colonies to Adelaide through the area. This route became the most important highway in South Australia, particularly after the discovery of gold in Victoria in the 1850s. The overland route contributed to an official survey of the Coorong region in 1844, but it was not until the early 1850s that European settlement took place, although in 1846, it was known that sheep were transported across the Murray Mouth onto Younghusband Peninsula to graze (Kluske, 1996: 45). In the 1850s, shipping within the lagoon began. It was initially hazardous, due to lack of knowledge of the depth of water, but after an 1866 hydrographic survey of the lagoon, it became commonplace for the paddle steamer *Vesta* to steam down to Salt Creek (Kluske, 1996: 45).

Figure 4. Shipwrecks along the Coorong. Drawn by J. Francis, 2000.

Shipwrecks, their survivors and Aboriginal contact

The first recorded ship wrecked adjacent to the Coorong/Younghusband Peninsula coast was the *Fanny* in 1838 (Clark, 1990). Table 1 summarises all the known shipwrecks during the period of traditional Aboriginal occupation of the Coorong region, i.e. up to the 1880s (Fig. 4). At this time, due to a number of reasons, primarily the European expansion into the area, Aboriginal people were relocated at the European settlements and towns. For shipwreck survivors the Coorong was an inhospitable stretch of coastline that held potentially grave consequences because of the lack of knowledge of where and how to obtain food and water. Prior to 1845 (the date for the settlement at Kingston, in the south), survivors may have had a walk of over 100 km back to the whaling station at Encounter Bay. For Aboriginal people who had lived there for thousands of years and knew where to obtain fresh water and how to obtain the great abundance of food, it must have been a plentiful place to live, in comparison with many other regions of Australia.

The three known instances of contact between the Coorong Aboriginal people with the survivors from the *Fanny*, *Maria* and *Mariner* are worth commenting on. However, prior contact may have occurred if a report of a very old shipwreck located along the Coorong is to be believed. Following the discovery of a shipwreck along the Coorong beach in 1955, it was reported that 'it [the vessel] was built of teak with fastenings probably 400 years old' (Moran, 2000). It has not been possible to rediscover the site and verify this report.

In the three known cases, where contemporary reports on their loss have been viewed, the earliest is the *Fanny*. This vessel, the crew (master, first mate and several ordinary seamen) and a couple with their young son, came ashore about 54 km east of Encounter Bay in 1838 (Clark 1990: 14).

> In the forenoon of the day after our wreck we were visited by nine natives. They brought us a firestick, showed us their water holes, and were every way well disposed; and during our stay amongst them, which was about seven weeks, they at all times envinced the greatest friendship. They are decidedly the most inoffensive race I have ever met (Captain Gill, skipper of the *Fanny* in SAGCR 8 September, 1838, in Jenkin, 1985: 280).

The other shipwreck, the *Maria* has received considerable attention over the years (Jenkin, 1985; Newland, 1936) and is worth commenting on again, more to illustrate the differences with the *Fanny* and the thinking of some of the key players in the South Australian Government and press, and the British Government at that time. It also illustrates the lack of understanding of Aboriginal culture at that time, which was probably wide spread amongst the European community. Newland's (1936) book fuelled this thinking; being a work of fiction in which he treats Aboriginals as 'savages', and is based on the *Maria* incident and 'is a fine example of the way in which fiction and perverted history have operated to misinform and prejudice the minds of generations of Australians' (Jenkin, 1985: 57).

While on a voyage to Hobart from Port Adelaide in June 1840, the *Maria* with 10 crew and 16 passengers was wrecked somewhere in the vicinity of Kingston. A longboat was later found near Kingston, which is 45 km south of the Coorong, and several theories have been made about the location of the wrecking. Drew, *et al.* (1982) found wreckage on the Margaret Brock Reef (Fig. 5) which could belong to the *Maria*, and contemporary accounts mentioned Baudin Rocks (further south, near Robe) as a possible location. The location has not been positively identified.

The 26 passengers and crew all managed to reach shore and commence the long walk (100 km) north to Encounter Bay. After a while the party split, some walked along Younghusband Peninsula and would have tried to cross the Murray Mouth, the others proceeded to Wellington, where the Overland Route between Adelaide and Melbourne, passed through. They were helped by the Milmenrura clan until for some reason, a violent altercation occurred and all the shipwreck survivors were killed. It is not known if any Aboriginal people were killed. The South Australian

Figure 5. Terry Drew with wreckage on the Margaret Brock Reef, possibly the *Maria*. Photo: B. Jeffery, 1982.

Figure 6. Shipwreck material, possibly from the *Mozambique* or *Kona*. Photo: B. Jeffery, 1996.

Government became aware of the killings and sent a party to investigate. They found all of the dead 26 passengers and crew (Tolmer, 1882: 192), although Jenkin (1985: 57) states that 'one young girl was saved and looked after'. The Governor of the day, Gawler, instructed the Commissioner of Police, Major O'Halloran to apprehend the whole clan and to execute (no more than three) those involved in killing the *Maria* survivors (Tolmer, 1882: 181–182). Tolmer, as an Inspector in the South Australian Police Force at the time, was a member of the party that apprehended the responsible clan (totalling 65) on 22 August 1840 (Clark, 1990: 17). Two members, Mongarawata and Pilgarie were voluntarily given up by the clan, and after a 'drumhead court martial' involving Tolmer, an Aboriginal man named Encounter Bay Bob, O' Halloran, Pullen, Bonney and Nixon, were found guilty and executed (hung) on 25 August 1840 (Tolmer, 1882: 188–189). The Milmenrura were told to leave them hanging and to bring women and children to view the men, to see how civilised men punish murderers. O'Halloran is reported to have said:

> Let none of you take these bodies down, they must remain till they fall in pieces. We are now friends, and will remain so, unless more white people are killed, when the Governor will send me, and plenty more policemen, and punish much more severely (Tolmer, 1882: 190).

There are conflicting reports on the reasons for the killings by the Milmenrura. One explanation given at the time is that the survivors fell in with the Milmenrura clan as they walked back along the Coorong, with whom they arranged to be delivered to Adelaide and as a reward they were prepared to give them clothing and blankets. The Milmenrura delivered them to the northern edge of their land. They knew the Aboriginal group north would deliver the survivors to Adelaide and get the reward. The Milmenrura took the possessions of the survivors and killed them as the survivors refused to give them anything. This explanation was provided to Richard Penny, surgeon at the Encounter Bay Fishery, by some Milmenrura Aboriginals in 1841. Penny was in the party which first found the bodies. This story is repeated on a number of occasions throughout the next 40 years.

Another explanation was given to the anthropologist Norman Tindale in 1934 (Clark, 1990: 17) by a Ngarrindjeri man named Milerum, who said that it was because of some of the *Maria* sailors who interfered with some native women, that everyone was killed. Whatever the reason, something very serious must have been committed by the *Maria* survivors for the Milmenrura to act the way they did, given their previous friendliness and assistance provided to the *Fanny* survivors. It is known from a letter published in the South Australian Register (3 October 1840) that Aboriginal groups, and possibly the Milmenrura were being 'butchered' by overlanders from Victoria:

> There has seldom been an arrival by land from Port Phillip or Sydney, which on its first reaching Adelaide, did not bring some tale of boasting and butchering the natives on the way. There are few in Adelaide who have not heard them vaunt of their exploits in shooting or "peppering" the natives in their route (Jenkin, 1985: 280).

Some of the factors that contributed to the way the South Australian Colonial Government in 1840 behaved in response to the killing of the *Maria* survivors were:

- There was considerable press in Adelaide about the killings and as a result, public outcry;
- The Milmenrura clan were known to be a brutal and ferocious clan to neighbouring groups. O'Halloran as Police Commissioner of Police is reported to have stated in 1840 that retribution of this particular nature to this clan was seen as a good example of the strength and power of the authorities;
- Also, the Governor was advised by his Council (Judges and Advocate General) that the crimes were beyond the reach of the British law because:

* No legal evidence could be obtained because the natives were atheists;
* Aboriginals were seen to be unacquainted with the obligations of an oath or solemn declaration and were not in British law valid witnesses;
* Aboriginals could not give evidence against Aboriginals because they were incapable of understanding the nature of appreciating the value of an oath;
* They also justified it [bush trail] by saying that justice should be implemented in front of their own people as a better example rather than take them away, which could have the effect that they be revered (Tolmer, 1882: 193–194).

In December 1840, four months after the execution of the two Aboriginal men, Protector of the Aborigines, Dr Moorhouse visited the Coorong and tried to make peace with the Milmenrura clan but they could not get to them. They found the Encounter Bay (Ramindjeri) clan returning from a fight with the Milmenrura clan. The Milmenrura clan were seeking retribution because the Encounter Bay clan told the whites of the *Maria* killings and of their involvement.

Tolmer (1882: 193) reported:

> The result of these reprisals by the police, under the instructions of his Excellency Colonel Gawler, was severely commented upon by the home authorities, and doubtless the unjust treatment he received in England, after his recall, was attributed to the mistaken decision arrived at by some persons miscalled philanthropists...I remember especially Mr George Stevenson was most bitter and vindictive in some of his articles at the time, expressing an opinion that Major O'Halloran and myself ought to have been sent home and tried for murder!

Governor Gawler was charged as an accessory to the murder of the two Aboriginals, but was acquitted. Today, there is an Aboriginal studies course for secondary students in years 8 to 10 that has been established to look into the issues surrounding the *Maria* incident (Anon, 1990) and which is highlighted in the 'Secrets of the Sea' Educational Resource Pack on South Australian Shipwrecks developed by Hartell (n.d.).

The survivors of the *Mariner* are the only other recorded survivors to have had contact with the Coorong Aboriginal people. The *Mariner* was on a voyage from Port Phillip (Melbourne) to Port Adelaide in 1845 with seven passengers when it was blown ashore about 60 km south of the Murray Mouth. The Police in Adelaide received a report about the shipwreck and arrived at the site two days after it had occurred. They found the survivors being threatened by the Coorong Aboriginal group, who were helping themselves to some of the *Mariner*'s cargo. Accompanying the Police were a group of Encounter Bay Aboriginals who were 'rendering great assistance' and this caused the Coorong Aboriginal people to disappear (Clark, 1990: 21).

Figure 7. The shells and stone contained in a midden. Photo: B. Jeffery, 1998.

Shipwreck remains

Some shipwreck remains, possibly related to these shipwrecks have been seen and reported over the last 50 years along the Coorong beach. It is a very mobile beach being adjacent to high energy seas and washed frequently with high tides. There are other remains that have been found along the Coorong beach, but they are the more modern remains of the vessels *Elsie* (1901) and *Margit* (1911).

The most photographed section of wreckage found along the beach was tentatively identified as belonging to the *Mozambique* (1854). The location for the *Mozambique* provided by historical documents (50 km south of the Murray Mouth) coincided with the location of the timber remains inspected by Heritage SA in 1996 and photographed by a number of people, since the 1960s. The same section of timber has on at least one occasion been referred to as belonging to the *Maria*, possibly due only to the infamy of this shipwreck (Heritage SA files).

Figure 8. The Coorong sign used in the Southern Ocean Shipwreck Trail. Compiled by J. Francis, 2000.

The wreckage is located about 100 m above the high tide limit on the beach and behind the foredune area, which is considered to have developed several hundreds of years ago. It consists of a section of timber decking, hull planking, hanging knees and deck beams that are of a size for the *Mozambique*, rather than any of the other known Coorong shipwreck (Fig. 6). The dimensions of the 'timber and space' (distance between and including one frame) found on the wreckage coincides with that contained in the *Rules and Regulations of Lloyd's Register* (1855: table B) for a 370-ton timber vessel. The recent discoverer of this material had some of the timber analysed and he reported that it was found to be about 180 years old (Banon, S.,1998, pers.comm.). It would be possible but doubtful that fifteen-year-old timber would be used in the major aspects of the construction of the *Mozambique*, although they could have been used in the fittings.

The only other shipwreck that comes close to matching the age of the timber remains is the *Kona*, although the dimensions of the timber remains are on the small side for it. The *Kona* of 670 tons, was wrecked off the northern coast of Kangaroo Island in 1917 and sections of the vessel floated around in Investigator Strait before landing on Yorke Peninsula (Coroneos, 1997: 65). Well-known maritime historian, Sexton (1997: pers. comm.) on viewing photographs of the wreckage along the Coorong, concluded that they could possibly belong to the *Kona*. Although the wreckage is above the present day high water mark it is located within a flat area, not isolated from the sea by a high foredune, that must have been awash at times. Seas are known to reach 200–300 m above high water mark in areas to the south of this locality (Hollow, P., 2001, pers.comm.).

During the inspection of this material in 1998 an Aboriginal family living in the vicinity stated that they had viewed some wreckage containing a figurehead while walking to the Coorong beach to obtaining cockles in the 1950s. They also passed on information about a previous family member seeing the same wreckage in the 1930s (Cameron, P. & M., 1998: pers.comm.). It is not known if the *Mozambique/Kona* is the site they were referring to, but it is in the same general locality.

Descendants of the indigenous original inhabitants, archival documents and the archaeological material (of European origin) associated with the Aboriginal shell middens are probably the most important evidence of the contact between indigenous and European cultures. Wood, iron and glass from bottles, some of which could

be from the era of these 19th-century shipwrecks, can be found amongst the fire hearths, shell and bone of the middens (Fig. 7). The area is a sensitive area in which to carry out any archaeological work, particularly excavation, due to the presence of human remains and therefore it may not be possible to implement this work. As a first step, a survey of middens on Younghusband peninsula, in the vicinity of the *Mozambique/Kona* shipwreck to see what material of European origin is contained within them would be worthwhile, if some questions with regard to cultural contact were to be developed and investigated. However, this should be preceded by discussion with the Aboriginal owners of the land to see if they would permit any archaeological surveys, and to ensure compliance with the *Aboriginal Heritage Act 1988*.

Shipwreck Interpretation

In 2000, the shipwrecks of the Coorong were grouped with the other shipwrecks of the south-east of South Australia to form an interpretive trail. The south-east of South Australia is a distinct geographical region that encompasses the coast and inland from the Murray Mouth to the South Australian/Victorian border. The region has its own distinct regional European history and therefore lends itself to this type of interpretive trail, of which seven others have been produced in South Australia (Jeffery, 2001). Titled the 'Southern Ocean Shipwreck Trail', it consists of eleven signs placed along the south-east coastline, and a 45-page booklet which provides additional information on the general history of the region, including some of the region's maritime mysteries (Moran, 2000).

The sign, used to interpret the Coorong shipwrecks has caused some controversy. The text is provided below and the layout of the sign provided in Figure 8.

> The 140 km long sweep of the Coorong running from the Murray Mouth running down to Lacepede Bay is a dramatic natural environment with its high energy ocean beach covering the wrecks of at least six vessels. Commencing with the little schooner *Fanny* in 1838 a succession of coastal vessels were blown ashore on the Coorong coast in westerly storms. Once driven up the steeply sloping beach and pounded by huge seas these vessels were totally destroyed. The Coorong's most notorious shipwreck story was the wreck of the brigantine *Maria* which sailed from Port Adelaide in 1840 and disappeared. A month later came reports that shipwreck survivors had been killed by Aborigines on the Coorong. A police party was sent to investigate and executed two Aboriginal men. This illegal act caused much controversy and Governor Gawler was recalled to England. The largest ship wrecked on the Coorong was put there by a navigational error. In 1911 the 1163-ton steel barque *Margit* sailed from Victor Harbor with a cargo of wheat, and inexplicably turned to port and ran aground in darkness. Parts of the steel frames can still be seen.

The sign has been placed in an area containing other interpretive signs related to the natural and cultural history of the Coorong National Park. Members of the Ngarrindjeri community recently complained that the text on the sign was inappropriate. While a sensitive issue, it was considered that the text of the sign was not judgmental being a factual account of what happened. The sign has been removed and an alternative text is being investigated in cooperation with Heritage SA and the Ngarrindjeri community (Hollow, P., 2001, pers.comm.).

Conclusions

The activities of the European sealers in the general area, the Barker incident in 1831, and the *Maria* incident in 1840 commenced and compounded a period of very poor race relations in South Australia. Coupled with this was a legal opinion from the British that South Australia was vacant of any inhabitants, which was proclaimed in the Act (*Foundation Act 1834*) used to establish the new colony. Given also the repeated altercations between Aboriginal groups and the new settlers, and the lack of respect for the different cultures, generally leading to Aboriginal people coming off second best, it is not 'surprising' that the *Maria* incident and the retributions occurred. The views of the colonial administrators in 1840 that the Milmenrura could not give evidence in a court was eventually changed in 1850 (Jenkin, 1985: 62), and the period between 1843 and 1848 was the 'main period of resistance' with settlers along the Coorong (Kluske, 1996: 33).

The nature and effect of the shipwreck survivor contact along the Coorong, from the *Fanny* (1838) to the *Maria* (1840) and *Mariner* (1845) shipwrecks would be worth further investigating given their different timing in the early history of South Australia. Of particular significance would be the lasting effects of the *Maria* and the other incidents. Have they contributed to the race relations of present day European and Aboriginals, in this region, in South Australia and Australia? Is the removal of the shipwreck interpretive sign an ongoing effect of the *Maria* tragedy? This investigation should also include a comparison with the other States to see what types of contact developed. Whatever contact studies are conducted, they need to consider questions, issues, sites and beliefs of both cultures to help explain the contact and the effects it had, and perhaps continue to have.

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Romancing a sixteenth century Spanish galleon in a California seashore

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Figure 1. Drakes Bay, Point Reyes National Seashore, Marin County, California. Beach shorelines with partial modern crate and 'white seacliffs'. Probable location of *San Agustin* wreck site (Photo: R. Kelly).

Figure 2. Post-1600 print of 'Crowning of Drake' by natives.

One of the most interesting and challenging maritime mysteries in California history occurred in what is now called Point Reyes National Seashore, about 50 miles (80 km) north-west from San Francisco Bay, one of the units of the US National Park Service. The main anchorage of the Seashore—Drakes Bay—is the stage for intriguing, significant maritime stories because it has been an historic anchorage since the late 1500s—longer than any other place along our nation's west coast (Fig. 1).

What is the mystery? Who were the actors in these fog-shrouded events? Part of our story begins with a bearded Englishman, Francis Drake, 'the Queen's pirate', and continues with a Portuguese mariner, Sebastian Rodriguez Cermeño, (no likeness known), followed 200 years later by Mexican sea travellers, and finally American skippers. These people represent 400+ years of sailing history in one place!

Our California school kids learn about Drake—whose wakes in the seas of history continue to lap at our shores. In 1579, he seemingly stumbled into a wide, crescent-shaped bay, which reminded him and his companions of the English coast. And we adult kids know with probability—yes, with controversy—as to where exactly he landed the *Golden Hinde* for repairs, and to claim the lands for his Queen, has been one of California's most notorious maritime mysteries (Fig. 2).

But the second act in the drama at Drake's Bay—that of Cermeño's 1595 encampment, then loss of his ship *San Agustin* remains unresolved. This is my principle theme—our collective efforts to find, identify, describe and study this very important 1595 event, which is of equal historical significance to Drake's landing, but better known in some respects.

The San Agustin

What can we say about the *San Agustin*, this phantom wreck on the shoals of history?

Even though very few facts are available, we assumed that this small galleon (200 ton, no greater than 100 ft [30.5 m] in overall length, 28 to 30 ft [8.5 to 9.1 m] in beam, and about 15 ft [4.6 m] in depth of hold) was not a Spanish Royal vessel but was built by Asian and Philippine workers, guided by Portuguese ship-builders, using Philippine woods which still grow there. Capitan Cermeño bought the ship second-hand, so it was an 'experienced lady of the southern seas' already (see Aker, 1965). The vessel was likely constructed in the early years of colonial shipbuilding at Manila or it may have sailed from from Spain's or Portugal's ports bound for merchant use in Asia. We are not sure even of its origin!

The *San Augustin* very likely carried three masts, but did not have the fancy superstructure works of later galleons, and probably was armed only with small calibre deck and swivel guns (Fig. 3). In spite of the lack of marine architectural details, we do know the vessel carried a cargo of 130 tons, including Chinese silks, beeswax, and Ming Dynasty porcelain, with ship's stores, spare equipment including anchors and personal possessions of its Spanish passengers, including priests and commanding officers (Aker, 1965). The crew was likely a mixed group of Philippino, Asian, and mixed blood men. It is very probable that the ship was overloaded since some

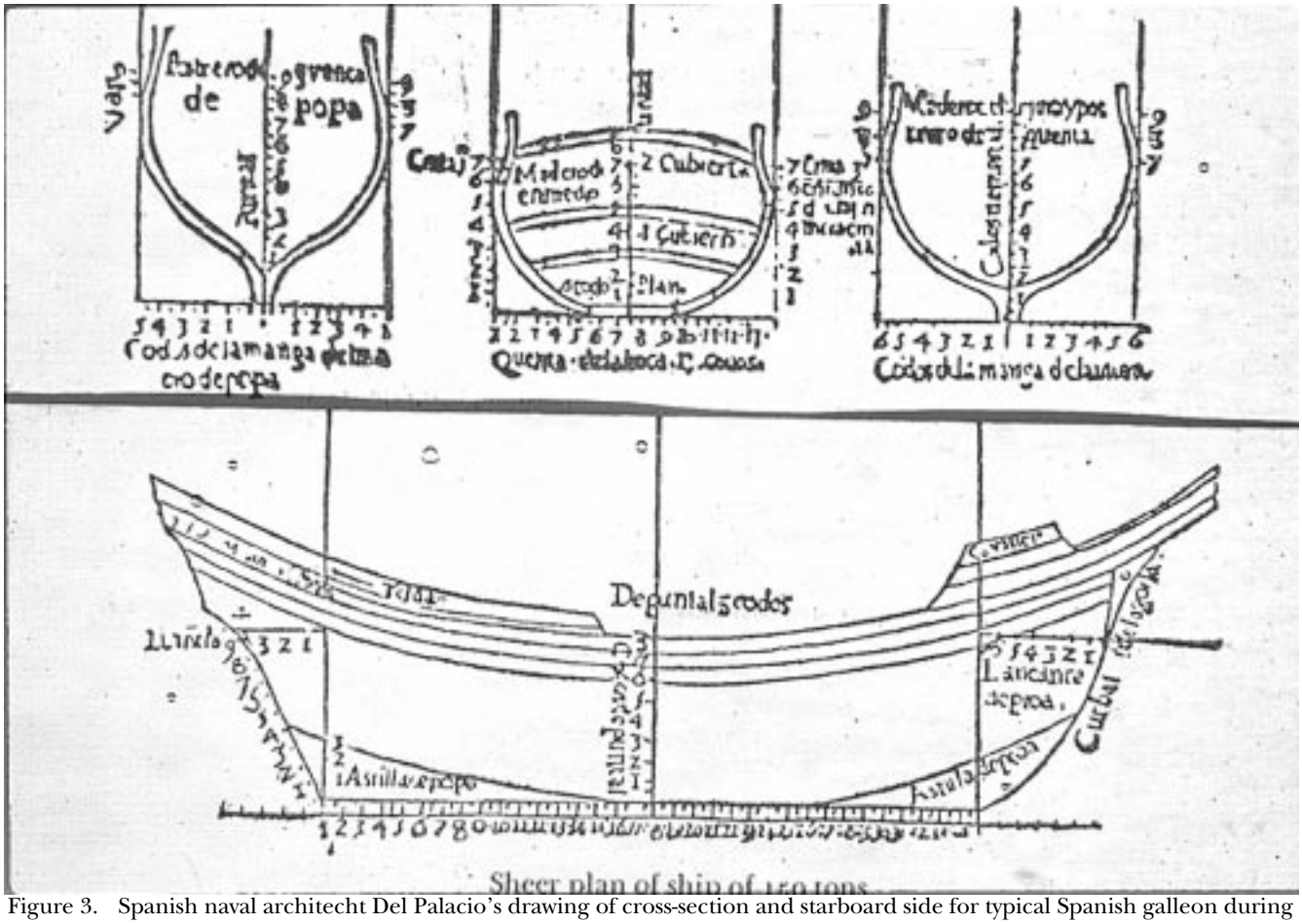

Figure 3. Spanish naval architecht Del Palacio's drawing of cross-section and starboard side for typical Spanish galleon during the 16th century.

materials were lost overboard in bad weather near Guam. It was not a royal 'treasure galleon' like those on the Atlantic route since its mission was for geopolitical and private commercial purposes (Fig. 4).

Cermeño's mission was to explore and claim lands for the Spanish crown (which he did); meet the native inhabitants and describe their customs (which he did); and, carry Ming porcelain consignments to New Spain (which he did not).

In November 1595, as the accounts go, he anchored off in the Bay, a little distance from shore, and commanded most of the crew to offload some ship's stores, cargo, and a disassembled longboat to a campsite on land. He took possession of the land for the Spanish King, sought fresh water and encountered a few Coast Miwok native residents. But the mid-November weather worsened, and shortly a full, howling storm from the south had broken the ship's anchor chains, setting the near-abandoned *San Agustin* adrift. The vessel probably became beached stern-first, and with each breaker, the hull, planking and ribs became loosened and broken, causing the hull to fill with water and superstructure to break away. Several lives were lost as well. Within a few days, the surviving crew and officers had salvaged what they could, buried their dead and cached some ship's stores and valuables for later recovery. They then began a very hard sail south to Acapulco, arriving two months later. The Coast Miwok gathered interesting objects from the beach, including porcelain and ship's spikes at least, since these artefacts have been found by archeological work in their native village sites. As legally required in New Spain, official investigation records regarding the loss preserve testimony about the wreck; but we do not have much information about the beginning of Cermeño's voyage, nor his second-hand galleon.

Using historical documents and electronic discovery methods, we have attempted two projects to find the illusive *San Agustin*, and the campsite, as well as other shipwreck sites in Drakes Bay.

1982–83 first effort

Backed up by available historical information that does not have the swirl of controversial interpretation as does the Drake theme, we used electronic devices in hopes of locating all or at least some, of the shipwrecks known to have occurred at the Drakes Bay area. But, even with state-of-the-art instruments, we were unsuccessful in finding the *San Agustin*, although we did locate several 20th-

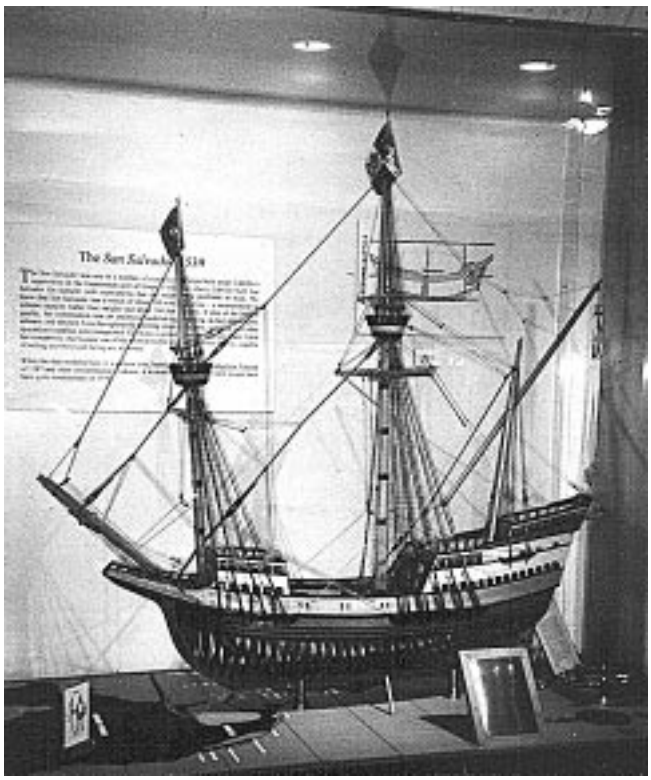

Figure 4. Model of a 16th century Spanish galleon on exhibit, San Diego Maritime Museum Association, San Diego, California (Photo: R. Kelly).

century wrecks. A report was prepared to show research results and methods used (Murphy, 1984). We utilized a tool kit of side-scan sonar, sub-bottom profiler, magnetometer, and metal detectors to help us see through the sands, silts, and rocky soils forming the submerged lands.

But over the next fourteen years—to 1997—several developments occurred which resulted in a second effort in October 1997. These were:

1. The passage of the *Abandoned Shipwreck Act* by US Congress in 1988;
2. Several law suits about the salvage of historic shipwrecks including Mel Fisher's quest for Spanish treasure;
3. Development of much better electronic remote sensing and communication systems for maritime use;
4. More research of shipwrecked 16th century galleons in the Pacific Rim, Gulf of Mexico, Florida and Western Europe; and
5. More interest in shipwreck issues by our sister federal and state agencies (see Kelly, 1999).

Second effort 1997

A second inter-agency team was formed and fieldwork commenced in October 1997. This time we were able to focus more narrowly on specific areas of submerged lands and were able to have many more diving hours for actual observations. What were our divers looking for and how would we know if we had found the galleon? And, we also knew how to increase diver safety by using 'shark nets' and a shark cage since this coastal area is known as a habitat for several shark species.

We looked for anchors of different sizes, small calibre guns, lead seals for silk textiles, earthenware jars, ballast stones from Philippine Island formations, and of course any remaining wooden members made of Philippine hardwoods. We know now which species of wood were commonly used for shipbuilding in colonial Manila area shipyards.

Over a month of specific and intensive fieldwork was accomplished. Are we successful suitors for this 'lost lady of the southern seas'? Not yet! Have the 400 lapsed years meant total disintegration of her remains? Has a ballast pile remained but anchors or small cannon corroded away? Why can't we distinguish ballast or heavy artefacts through electronic, sonic or acoustic methods? Are any Chinese Ming porcelains still on the bottom, occasionally washing onto the beaches as teasing hints of some undiscovered cluster of collapsed cargo? We believe so. The electronic and magnetic anomalies documented in 1997 need further diving time to explore. In 1998–99, a local avocational maritime research organization used magnetometers and metal detectors under a Park Service permit to search for Cermeño's campsite but did not locate any potential locations. And so, time's veil continues to conceal answers to this story!

But what of the maritime events centuries later? Between the 1840s and 1914, about a dozen other vessels came to grief along the sandy beaches of Drakes Bay. These were mostly schooners, plying the coastwise trade. Most have not been found although we have located four 20th century wrecks—*Richfield*, an oil tanker; *Munleon* and *Hartwood* which were small freighters; and portions of the *Pomo*, a lumber schooner lost in 1914. Even today, recreational boats get into trouble in or around Drakes Bay occasionally.

Thus, Drakes Bay within Point Reyes National Seashore still holds many secrets, and is one of those very few global locations where exploring representatives of two world powers both claimed lands and peoples nearly simultaneously. Visits by Drake and Cermeño, and an unproductive return in 1603 by a Spanish vessel to salvage *San Agustin*'s wreckage missed the greatest treasure of all—San Francisco Bay—which was not 'found' until the 1770s. A map of that time shows a cross in the correct location with the legend in Spanish: 'Here was lost the *San Agustin*'—the event had been remembered for nearly 200 years!

Had Cermeño not lost his flagship and explored a little more, the North American port sought by Spain for her galleon trade might have been our 'Golden Gate', changing California's history.

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Beyond the wrecked ship: the Northern Territory's shipwreck database

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Introduction

The Northern Territory Shipwreck Database (NTSD) has undergone many changes since its conception as a card index system in the late 1970s, not only in structure, but also in purpose. It is no longer a database containing just shipwrecks, whether they are historic or not, but a database that contains shipwrecks plus two additional categories of site type: aircraft and a miscellaneous category called 'other' (see Appendix 1).

From a listing of 29 sites in 1991, the NTSD now contains data on 232 ships boats and barges, 73 aircraft and 14 other sites that have been lost or left in Northern Territory waters. The inclusion of two extra site types has not only increased the numbers contained in the database by a third, but also broadened public interest in cultural material found in the sea.

Submerged aircraft wrecks, such as Catalina flying boats, are perhaps obvious extensions to a shipwreck database. Other aircraft however, not necessarily related to maritime activity such as Spitfires and Kittyhawks, are not. Nevertheless, when added, they do give a new and valid sphere of interest. They represent a social system that operated primarily from the land, but which survives today in the sea. These sites, it is argued, should not be ignored, but incorporated and managed in the same way that some shipwrecks are managed. By inclusion they provide a better understanding of the maritime cultural resources of the region.

Despite these changes, the NTSD continues today to achieve its original basic aim, which was to record shipwrecks. However, it has not been as successful with some of its other goals. The database has become complex to manage and requires technical support to maintain. It is under-utilised because public access is very limited. Because the public is not using it directly, it is not being tested and, therefore, suffers from a lack of feedback. The challenge for the next few years will be to balance the cost of product delivery, with that of acquiring new information, updating existing data and maintaining a system that works.

A background history of the NT shipwreck database

Dr Colin Jack-Hinton, the foundation Director of the Museum and Art Gallery of the Northern Territory (MAGNT), began collecting information relating to shipwrecks sometime after his appointment as the Museum's Director in 1970. It was not until after 1976, however, that the idea of a formal registry or index system began. This was brought about in part by three events which took place during that year. The first was the recovery of the *Brisbane* anchor from Fish Reef (*Fiji Times*, 1976); the second was the passing of the Commonwealth *Historic Shipwrecks Act 1976*; and, the third was the convening of the *First Southern Hemisphere Conference on Maritime Archaeology* held at Fremantle in Western Australia (Green, 1977).

Sometime after the conference, Jack-Hinton began a shipwreck card index system. Its purpose was more of an *aide de mémoire* than the public utility it has become today. It contained four or five fields of information. The name of the vessel, the date it was wrecked, its location and a reference to the source of the information. The publication of Bateson's (1972) work on Australian shipwrecks had been a useful starting point for Jack-Hinton's index system. However, it only covered the early years 1622–1850 and, therefore, contributed only a few names to the list of wrecked vessels in Northern Territory waters. The appearance of Jack Loney's books (1980 & 1982) on Australian shipwrecks covering the years 1851–1900, however, added many more.

In 1988, Nic Burningham published a list of ten iron and steam vessels in Northern Territory waters (Burningham, n.d. [1988]). Most, if not all, of the data contained in the original card index was obtained from Bateson (1972) and Loney (1980, 1981, 1982). In 1991, one of the authors (Clark) converted the card index system to a computer database. During the transition, the number of fields of information was increased to 35 and the quality of the referenced information checked. Some vessels were struck off the list because they were either outside Northern Territory waters,[1] or were in fact not a wrecking, but a later refloating. An unpublished MAGNT report for this period (Clark, *et al.*, 1992) lists 34 shipwrecks on the database at the end of 1991.

For the next few years 1992–95 information was progressively added to the database by one or two methods. It was either acquired by conducting year by year newspaper research, or by project-based research. Jung's (1992a) literature survey for macassan *perahu* wrecks and his Cyclone Tracy research (Jung, 1992b) yielded a number of potential new sites for the database. McCarthy's (1992) World War II shipwrecks report, added a few new sites but greatly increased the level of knowledge of the existing ones. Dennis[2] (1993) and Clark & Jung (1995) also added to the list with the Beagle Gulf survey. By 1995 the NTSD had 85 shipwrecks, 23 aircraft and 2 'others' (see Table 1 & Fig. 1.)

The next major change that came about to the NTSD occurred in 1996. It was not just an increase in numbers, but also a structural change to the architecture of the

database. The flat file database that had been constructed from Dr Jack-Hinton's index cards, was converted to semi-relational database. This provided search facilities across a number of fields so that trends and patterns and other distributions could be analysed (Coroneos 1996b). Also in the process of this conversion several new fields were added and the field definitions, matched to that of the National Historic Shipwreck Database managed by the Western Australian Maritime Museum on behalf of the Commonwealth Department of the Environment and Heritage and AIMA. The last change major change was in 1999, when the structure was totally reorganised and converted to a fully relational database. Included in this re-organisation was a new field for images.

Year	Wrecks	Aircraft	Other	Total
1990	10	-	-	10
1991	29	-	-	29
1992	60	-	-	60
1993	82	5	2	89
1994	82	5	2	89
1995	85	23	2	110
1996	152	36	5	193
1997	152	36	5	193
1998	152	36	5	193
1999	232	73	14	319

Table 1. Summary of shipwrecks, aircraft and other wreckage added to the database by year.

A discussion of sites added since 1995

This section provides a brief overview of the additional information that has been acquired sine 1995 on shipwrecks and other cultural material found in Northern Territory waters. A significant number of shipwrecks have been added to the database, that correspond to catastrophic events such as cyclones that frequent the north Australian coast during the north-west monsoon season (see Appendix 1). These vessels are predominantly wooden pearling luggers that foundered or were wrecked in the late 1890s and during the early and late part of the 20th century. Since the update of the NTSD in 1995, more vessels, however, have been sunk as a result of deliberate action, rather than mishap.

Indonesian fishing *perahus* have been sunk as artificial reefs in recent times and these are represented in the database (see Appendix 1). The loss of these vessels could imply that the shipwrecks in the Northern Territory have come full circle. Indonesian vessels were some of the earliest vessels recorded to have been lost, they are now the most recent.

Additional information on the submerged cultural material in the Northern Territory has identified 65 additional shipwrecks, together with 37 additional aircraft wreck and ten new sites referred to as 'other', such as artificial reef systems and isolated finds (Appendix 3).

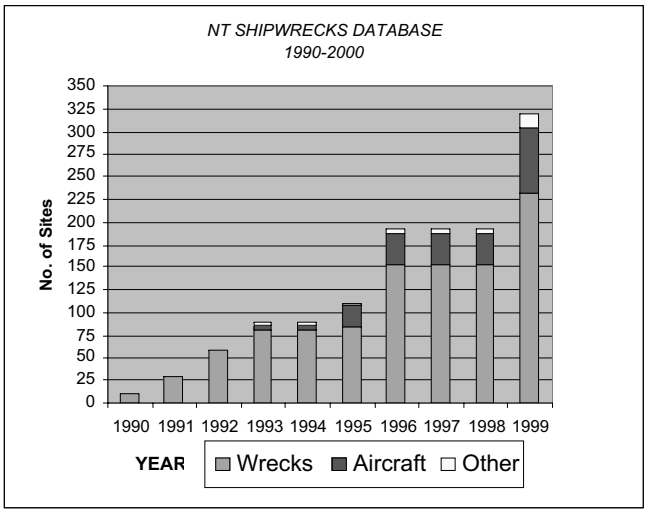

Figure 1. Bar chart with accumulative summary of shipwrecks, aircraft and other wreckage by year.

These new sites represent a change in the pattern of site types that are found in the Northern Territory. This change is dated between 1942 to 1945, the north Australian war, when more machines and lives were lost at sea than at any other time in the history of the Northern Territory. Aircraft wrecks, appear during this time and many more were lost than shipwrecks (see Appendix 2). Approximately 70 aircraft were lost compared to a dozen vessels during WW2.

The loss of so many aircraft in the sea represents a significant cultural resource (see Appendix 2). Only five aircraft wrecks, however, have been inspected by archaeologists and these are the Catalina flying boats in East Arm, Darwin Harbour. Two United States Navy (USN) and three Royal Australian Airforce (RAAF) aircraft have been identified, but one other USN aircraft is yet to be relocated (Jung, 2001). The locations of the other aircraft wrecks are not officially recorded or verified.

The military occupation of Darwin Harbour saw the construction of support facilities such as jetties and fish traps. The flying boat base at the RAAF base in East Arm, for example, supported the maritime time activities that were required to keep the Catalinas operating. A similar support function was provided by the Channel Island Leprosarium jetty.

The jetty was the only accesses point and a reminder today of the island's isolation prior to the construction of a bridge. Jetty sites in Darwin Harbour, as a result, represent important sources of information into the requirements of past maritime activities in the harbour.

Future directions of the NTSD

In order for the NTSD to work as a research tool, it is important that the history of past maritime events is also complied on shipwrecks, aircraft wrecks and other sites that were temporarily lost, but have since been recovered. The NTSD does not include raised site or strandings, despite a growing body of knowledge along side the

maritime archaeological understanding of the region's potential. As a result of the NTSD update since 1995, some sites have been dropped from the database as more information is obtained, but an explanation for their removal from the database is warranted. The current NTSD is suitable for answering questions as to what is and what could be found in Northern Territory waters, but is unsuitable for determining what was and what is not.

The NTSD should eventually be available on the Internet. The value of spending resources on Internet distribution of shipwreck databases has been questioned, as resources need to be directed at identifying and verifying the information that is currently available (Nutley 1996:10). The information contained in the NTSD is, however, currently stored within the Museum and Art Gallery of the Northern Territory collection, located in Darwin. A member of the public must make a personal visit to access the data. The internet will provide a medium for its release to the public while still retaining control and ownership. As a result, it is anticipated that new sites will be reported in the future and more information will be obtained on existing sites as a result of feedback from the public.

Conclusion

One purpose of this paper has been to report on the current state of knowledge, or in other words a stock take of assets and to report on progress during the previous decade. From relatively humble beginnings an information system has developed into a valuable resource of interest to students, planners and tourists to name a few. However, the problems of getting the information to these groups, continue to plague the program. These problems need to be addressed quickly if the database is to continue to fulfil its original purpose (ie. to record shipwrecks) let alone deliver on some of the additional things it now does. The challenge for the future therefore will be to balance the cost of product delivery, with the requirements of funding for updates, system maintenance and continue the process of recording new and verifying old shipwreck data.

Acknowledgments

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Appendix 1 Northern Territory Shipwreck Database: Shipwrecks

Total Wreck #	Vessel name	Date Lost	Where lost	How lost
1	Afric	1915	Off Croker Island	Foundered
2	Africa	1915	Darwin Harbour	Unknown
3	Alligator River – Unidentified Vessel	1841	Van Dieman Gulf	Unknown
4	Ann Millicent	1888	Southern tip of Cartier Reef	Wrecked
5	Ark	1897	Darwin Harbour	Foundered
6	Arnhem T	1974	Frances Bay, Darwin Harbour	Wrecked
7	Arrow – HMAS	1974	Iron Ore Wharf (later raised & buried in John Holland Yard as land fill)	Wrecked
8	Astraea	1886	Off Darwin	Unknown
9	Ataluma	1974	Dudley Point, Darwin Harbour	Wrecked
10	Australian	1906	Vashon Head, Coburg Peninsula	Stranded
11	Avra	1965	Arafura Sea	Foundered
12	Bartalumba Bay Wreck	?	Bartalumba Bay, Groote Eylandt	Unknown
13	Bathurst Island – Malay Perahu 1	1917	NW side of Bathurst Island	Broken up
14	Bear Sing	1886	Darwin Harbour	Foundered
15	Bell Bird	1974	Doctor's Gully, Darwin Harbour	Wrecked
16	Bengal	1874	Vashon Head, Port Essington, Coburg Peninsula	Wrecked
17	Bertie	1886	Off Port Bremer, Coburg Peninsula	Foundered
18	Betty Joan	1974	Frances Bay, across Sokes Hill power station C/w outlet	Wrecked
19	Bickerton Island Perahu	?	Bickerton Island	Unknown
20	Black Jack	1897	Darwin Harbour	Foundered
21	Blue Bird	1974	Iron Ore Wharf, Darwin Harbour	Wrecked
22	Bonding Patola (Perahu)	1885	Caledon Bay	Wrecked
23	Booya	1974	Unknown	Unknown
24	Brisbane	1881	Fish Reef	Stranded
25	Brisbane (Lugger)	1887	Darwin Harbour	Unknown
26	British Motorist	1942	Darwin Harbour	Bombs
27	Brolga (Customs code name)	1995	Fenton Patches	Scuttled
28	Burns Shoal Wreck	?	East of Burns shoal, north of Groote Eylandt	Unknown
29	Calcutta	1894	Vashon Head, Coburg Peninsula	Wrecked
30	Cameo	1919	Darwin Harbour	Foundered
31	Cape Arnhem Wreck	?	Near Sir Rodericks Rocks, Cape Arnhem	Unknown
32	Cape Brogden Perahu	1892	Cape Brogden	Unknown
33	Cape Don Perahu	1960	Near Cape Don	Wrecked
34	Cape Grey Wreck	?	Doyle's Rock, Cape Grey	Unknown
35	Cape Hotham Wreck	?	West side of Cape Hotham	Unknown
36	Cape Wilberforce Perahu	1902	Cape Wilberforce (Limba Pappa)	Wrecked
37	Caprice	1964	100 km north of Darwin	Unknown
38	Carina	1974	Stokes Hill Wharf, Darwin Harbour	Wrecked
39	Chang 1028	1978	Reichardt Creek, Darwin Harbour	Scuttled
40	Charity	1897	Unknown	Unknown
41	Charles Todd	1974	350m off Iron Ore Wharf, Darwin Hbr	Wrecked
42	Chinta	1974	Stokes Hill Wharf, Darwin Harbour	Wrecked
43	Cockatoo (Customs code name)	1995	Fenton Patches	Scuttled
44	Con Dao 3	1978	East Arm, Darwin Harbour	Scuttled
45	Coral	?	Darwin Harbour	Broken up
46	Crocker Island Perahu	1892	Crocker Island	Wrecked
47	Daly River–Unid Vessel 1	?	Daly River	Unknown
48	Darwin Hbr–UnidChinese Fishing Boat 1	1888	Darwin Harbour	Unknown
49	Darwin Hbr–Unid Chinese Junk 1	1897	Darwin Harbour	Unknown

50	Darwin Hbr–Unid Lugger	1939	Darwin Harbour	Fire
51	Darwin Hbr–Unid Lugger 2	1910	Darwin Harbour	Scuttled
52	Darwin Hbr–Unid Vessel 2	?	Darwin Harbour	Unknown
53	Darwin Hbr–Unid Wreck 1	?	Darwin Harbour	Unknown
54	Darwin Princess	1974	Unknown	Unknown
55	Dawn	1943	Darwin Harbour	Wrecked
56	Dieman – NR	1974	Off Mandorah Jetty, mouth of Darwin Harbour	Wrecked
57	Dolphin IV	1965	Off Cape Hay	Foundered
58	Don Isidro – TSS	1942	North of Cape Fourcroy, Bathurst Island	Bombs/gunfire
59	Douglas Mawson	1923	Gulf of Carpentaria	Unknown
60	DSAC BARGE	1988	1km off Dudley Point, Darwin Harbour	Scuttled
61	Eagle (Customs code name)	1995	Fenton Patches	Scuttled
62	East Arm – Barge 2	1945	East Arm, Darwin Harbour	Unknown
63	East Arm – Two Part Barge	1945	East Arm, Darwin Harbour	Unknown
64	East Arm – Vietnamese Refugee Boat 1	1976	East Arm, Darwin Harbour	Stranded
65	East Arm – Vietnamese Refugee Boat 2	1976	East Arm, Darwin Harbour	Stranded
66	East Vernon Island Wreck	?	Rooper Rock, east of East Vernon Island, Clarence Strait	Unknown
67	Editha	1963	Cape Hay	Foundered
68	Edwina May	1974	Stokes Hill Wharf, Darwin Harbour	Wrecked
69	Eileen	1939	Pt Charles (Charles Pt)	Unknown
70	Elizabeth River – Unid Vessel	?	Elizabeth River–East Arm	Unknown
71	Ellengowan	1888	Near Channel Island (Darwin Harbour)	Foundered
72	Ena	1937	Smith Point, Coburg Peninsula	Wrecked
73	Erang Polea	1886	North side of Melville Island	Wrecked
74	Essington	1919	Victoria River	Unknown
75	Evangel (Greenhill Island Wreck)	1903	Greenhill Island	Wrecked
76	Evangel (Night Cliff Wreck)	1901	Night Cliff, Darwin Harbour	Wrecked
77	Faith	1897	Between Darwin and Western Australia	Unknown
78	False Point Perahu	?	False Point, near Cape Stewart	Unknown
79	Florence D	1942	60 nm (?) NW Bathurst Island	Bombs/gunfire
80	Flowerdale	1899	Darwin Harbour	Fire
81	Flying Cloud	1894	Frances Bay, Darwin Harbour	Wrecked
82	Flying Dutchman	1951	Adelaide River	Wrecked
83	Gertrude	1896	Darwin Harbour	Unknown
84	Good Intent	1892	Between Darwin and Charles Point	Foundered
85	Gove–Unid Vessel 1	?	Gove	Unknown
86	Gove–Unid Vessel 2	1945	Gove	Fire
87	Groote Eylandt Perahu	?	Angwarigba Point, Groote Eylandt	Unknown
88	Groote Eylandt–Unid Vessel 1	?	Groote Eylandt	Unknown
89	Gulnare	1872	Near Fort Hill, Darwin Harbour	Stranded
90	Gunyana	1974	Darwin Harbour or further west into Beagle Gulf	Foundered
91	Ham Luong	1983	Middle of Darwin Harbour	Scuttled
92	Hankow	1932	Due west of East Point	Gunfire
93	Harold	1942	Darwin	Unknown
94	Harriet	1915	Near Darch Island?	Unknown
95	Henchman	1989	Near Groote Eylandt	Foundered
96	Hibernia	1882	Darwin Harbour	Unknown
97	Holly	1940	Roper River	Foundered
98	I-124	1942	Beagle Gulf	Depth charge
99	Ibis	1948	Snake Bay, off a small island of Melville Is	Unknown
100	Ionic	1919	Quail Island, Northern Territory	Unknown
101	Ionie	1919	Darwin Harbour?	Wrecked
102	Islander IV	1971	Arafura Sea	Foundered
103	Jack	1896	Darwin Harbour	Unknown
104	Jane Anderson	1886	Cape Fourcroy	Foundered
105	Jenny Wright	1974	Iron Ore Wharf	Wrecked
106	John Holland Barge	1982	Middle of Darwin Harbour	Scuttled
107	Kathie	1922	Blunder Bay, Victoria River	Wrecked
108	Kathleen	1873	Emery Point, Darwin Harbour	Unknown
109	Kelat	1942	East Arm, Darwin Harbour	Gunfire

110	L Ann	?	Mandorah	Unknown
111	Landing Barge	?	Darwin Harbour	Unknown
112	Lasalasya	1886	North side of Melville Island	Wrecked
113	Leichhardt	1915	Darwin Harbour	Fire
114	Leila	1915	Darch Island	Wrecked
115	Lighter No 2	1943	Near Darwin	Unknown
116	Lizard Bay Wreckage	?	Lizard Bay, Port Bremer, Coburg Peninsula	Unknown
117	Llyris	1934	Trial Bay	Unknown
118	Loellen N	1965	Off Cape Hay	Foundered
119	Ludmilla Creek – Unidentified Refugee Boats		?Ludmilla Creek, Darwin Harbour	Abandoned
120	Macumba	1943	West of Elcho Island	Bombs
121	Magda	1858	Reef off Cape Van Dieman, Melville Island	Wrecked
122	Malay Bay – Unidentified Perahu	1892	Malay Bay	Wrecked
123	Mallison Island Perahu	1874	Mallison Island	Unknown
124	Mandorah Queen	1974	Off Mandorah Jetty, Darwin Harbour	Wrecked
125	Mandorah – Unidentified Vessel 1	?	Mandorah	Unknown
126	Mandorah – Unidentified Vessel 2	?	Mandorah	Unknown
127	Maningrida wreck 1	?	North of Maningrida	Unknown
128	Maningrida wreck 2	?	North of Maningrida	Unknown
129	Maningrida wreck 3	?	North of Maningrida	Unknown
130	Marchart 3	1988	Fenton Patches	Scuttled
131	Marchinbar Island Perahu	?	Marchinbar Island	Unknown
132	Margaret	1888	Darwin Harbour	Unknown
133	Margaret Mary	1965	On reef off Cape Hay	Wrecked
134	Maroubra	1943	Northern Territory	Unknown
135	Mauna Loa – USAT	1942	Darwin Harbour	Bombs
136	Mayvi	1984	SE Gulf of Carpentaria	Unknown
137	Meigs – USAT	1942	Darwin Harbour	Bombs
138	Melville	1917	Melville Island	Foundered
139	Melville Island Perahu 1	1882	Melville Island	Unknown
140	Melville Island Perahu 2	1886	North side of Melville Island	Wrecked
141	Middle Arm – unidentified vessel	?	Middle Arm – Darwin Harbour	Unknown
142	Midge	1907	Darwin Harbour	Fire
143	Millingimbi wreck	?	Millingimbi Island	Unknown
144	Minnie	1885	Cape Wessel	Wrecked
145	Minniehaha	1907	Daly River	Wrecked
146	Miryo Maru	1972	10 m E of New Year Is, NT	Unknown
147	Mount Norris Bay – Unidentified vessel	1915	Mount Norris Bay	Wrecked
148	Mudlark (Customs code name)	1995	Fenton Patches	Scuttled
149	Nebraska	1908	Greenhill Island	Wrecked
150	Neptuna	1942	Stokes Hill Wharf, Darwin Harbour	Bombs
151	Neptune	1911	At Melville Island	Unknown
152	Nimrod	1974	Stokes Hill Wharf, Darwin Harbour	Wrecked
153	Northern Peal	1979	Mornington Island, Gulf of Carpentaria	Foundered
154	Oituli	?	East Arnhem Land	Unknown
155	Olga	1926	Near Darwin	Fire
156	Olive	1897	Darwin Harbour	Unknown
157	Opal	1915	Off Croker Island	Foundered
158	Orontes	1838	Vashon Head, Port Essington, Coburg Peninsula	Stranded
159	Ouida	1931	Between Port Keats and Port Hay	Wrecked
160	Oxley Island – Unid vessel 1	?	Oxley Island	Unknown
161	Patricia Cam – HMAS	1943	Near Wessel Island	Bombs
162	Pearl	1920	Victoria River	Foundered
163	Peary – USS	1942	Darwin Harbour	Bombs
164	Peron	1948	Near Darwin	Unknown
165	Peron Island – unnamed wreck	1985	Near Peron Island	Foundered
166	Phoenix	1950	North-western coastline of Australia	Unknown
167	Phoenix (motor lugger)	1920	Vernon Islands	Wrecked
168	Pinafore	1881	25 miles out of Fannie Bay, Darwin Harbour	Foundered
169	Pjuma Malaya	1895	Sir Rodericks Rocks	Wrecked
170	Polpye	1913	Port Keats	Wrecked
171	Port Bradshaw Perahu 1	?	Port Bradshaw	Unknown
172	Port Bradshaw Perahu 2	?	Port Bradshaw	Unknown
173	Port Bradshaw Perahu 3	?	Port Bradshaw	Unknown

174	Port Bradshaw Perahu 4	?	North end of Port Bradshaw	Unknown
175	Port Essington Perahu 1	1847	Outside Port Essington, Coburg Peninsula	Foundered
176	Port Essington Perahu 2	1847	Outside Port Essington, Coburg Peninsula	Foundered
177	Port Essington Perahu 3	1847	Outside Port Essington, Coburg Peninsula	Foundered
178	Port Essington Perahu 4	1847	Outside Port Essington, Coburg Peninsula	Foundered
179	Quida	1932	Off Peron Island	Unknown
180	Rachel Cohen	1924	Frances Bay, Darwin Harbour	Fire
181	Rasta	1974	Darwin Harbour	Wrecked
182	Red Gauntlet	1887	7 miles WSW of Vashon Head, Coburg Peninsula Most likely from historical accounts wrecked on Allaru Island	Wrecked
183	Renard	1875	Cape Keith	Stranded
184	Revenge	1896	Darwin Harbour	Unknown
185	Rockhampton	1885	Mouth of Kimberley River, NT	Fire
186	Rocky Bay Perahu	?	Rocky Bay near Yirrkala	Unknown
187	Roebuck	1896	Darwin Harbour	Unknown
188	Roper Bar – Unidentified Vessel	1878	Roper Bar	Fire
189	Ruby	1918	Off Melville Island	Unknown
190	Runic	1934	?	Unknown
191	Sandbar barge	?	Near Emery Point, west side of sandbar	Unknown
192	SF Hersey	1886	Darwin Harbour	Wrecked
193	Sajavia	1948	Pt Arrowsmith (Arrowsmith Pt)	Unknown
194	Sandy Island No1 Perahu	?	SE of Sandy island No 1, Coburg Peninsula	Unknown
195	Sanyo Maru	1937	Off Liverpool River	Foundered
196	Scallywag	1974	Darwin Harbour	Wrecked
197	Scout	1896	Darwin Harbour	Unknown
198	Sedco Helen	1970	Joseph Bonaparte Gulf 05-1km from Petrel 1 (or Petrol 1) well head	Foundered
199	Semenget Baru	1960	Near Cape Fourcroy, Bathurst Island	Wrecked
200	Shady Camp Refugee boat	?	Shady Camp, Mary River	Scuttled
201	Shelley B	?	Bynoe Harbour	Unknown
202	Song Saigon	1982	Middle of Darwin Harbour	Scuttled
203	Spray	1915	Darwin Harbour	Foundered
204	Stokes Hill Indonesian Vessel 1	1999	Fishing platform, Stokes Hill Wharf	Scuttled
205	Stokes Hill Indonesian Vessel 2	1999	Fishing platform, Stokes Hill Wharf	Scuttled
206	Stokes Hill Indonesian Vessel 3	1999	Fishing platform, Stokes Hill Wharf	Scuttled
207	Tamarama	1973	Melville Island	Unknown
208	Thomaz Andreas	1901	5 miles off Peron Islands, NT	Foundered
209	Timor Sea – Indonesian Fishing Vessel	1997	Timor Sea	Foundered
210	Trepang Bay – Unid Vessel 1	1915	Trepang Bay	Foundered
211	Trial Bay Perahu 1	?	Trial Bay	Wrecked
212	Triumph	1954	Off Darwin	Foundered
213	Truant Island Perahu	?	Truant Island	Unknown
214	Two Friends	1887	'Karega' – Junction Bay	Unknown
215	Vanderlin Island Perahu	?	Vanderlin Island, western coast	Unknown
216	Vanderlin Island wreck	?	West of Vanderlin Island	Unknown
217	Venture	?	Cape Keith, Bathurst Island	Wrecked
218	Veronica	1886	Between Bowen Straits and Darwin	Unknown
219	Vietnamese Refugee boat – East Arm	?	East Arm, Darwin Harbour	Unknown
220	Vietnamese Refugee Boat PK76	74	Doctor's Gully, Darwin Harbour	Abandoned
221	Wanderer	1918	Roper River	Unknown
222	Warawi	1974	Off Arnhem Land	Unknown
223	Warrego	1919	Stokes Hill Power Station site	Wrecked
224	Wild Duck	1876	5 miles north-east off Cape Van Diemen, Melville Island	Wrecked
225	Willie	1916	Cape Don	Unknown
226	Winchelsea Island wreck	?	Winchelsea Island, Gulf of Carpentaria	Unknown
227	Yampi Lass	1943	Darwin	Wrecked
228	Yarra	1884	Scotts Reef, north of Broome	Wrecked
229	Young Australian	1873	Roper River	Wrecked
230	Yu Han 22	?	Weed Reef, Darwin Harbour	Scuttled
231	Zealandia	1942	Darwin Harbour	Bombs
232	Zulieka	1896	Middle Arm – Darwin Harbour	Wrecked

Appendix 2. Northern Territory Shipwreck Database: Aircraft wrecks

Total Wreck #	Name/type/designation Owner/Aircraft	Date lost	Where lost	How lost
1	D3A 'Val'	1942	North of East Point, Darwin Harbour.	Gunfire
2	Mitsubishi G4MI 'Betty'	1942	Nightcliff, Darwin Harbour.	Gunfire
3	Mitsubishi Ki-15	1942	West of Bathurst Island 22 March 1942.	Unknown
4	Mitsubishi 'Zero' 1	1943	In sea off NT, 2 March 1943. Shot down by Spitfire after air raid on Coomalie Creek.	Shot down
5	Mitsubishi 'Zero' 2	1943	Ditto	Shot down
6	Mitsubishi 'Zero' 3	1943	Ditto	Shot down
7	Mitsubishi 'Zero' 4	1942	Off north shore of Cox Peninsula. 31 March 1942.	Shot down
8	Portuguese Heron	?	Into sea NW of Melville Island.	Unknown
9	Qantas Short Empire Flying Boat 'Corinthian'	1942	Darwin Harbour.	Wrecked
10	RAAF Beaufighter	1943	Mud flat, Arnhem Land coast 2 Jan 1943.	Unknown
11	RAAF Beaufighter A19-156	1944	Cartier Island, Timor Sea 6 April 1944.	Anti-aircraft fire
12	RAAF Beaufighter A19-86	1943	8 miles S to W Peron Island, Anson Bay.	Unknown
13	RAAF Boomerang A46-159	1944	Into sea, North Boucaut Bay 29 May 1944.	Unknown
14	RAAF Catalina PBY-5 A24-50	1943	Groote Eylandt area 2 Sept. 1943.	Unknown
15	RAAF Catalina PBY-5A (M) A24-69	1945	South Shell Island, East Arm, Darwin Hbr.	Fire
16	RAAF Catalina PB2B-1 A24-206	1945	East Arm, Darwin Harbour.	Depth charge
17	RAAF Catalina PBY-5 A24-1	1945	East Arm, Darwin Harbour.	Crashed on take off
18	RAAF Dornier A49-5	1944	Darwin Harbour 11 March 1944.	Fire
19	RAAF Lockheed Hudson A16-??	?	Lake Woods.	Unknown
20	RAAF Lockheed Hudson A16-??	1942	In sea off Cape Fourcroy 18 March 1942.	Unknown
21	RAAF Lockheed Hudson A16-132	1942	Timor Sea 17 June 1942.	Unknown
22	RAAF Lockheed Hudson A16-234	1942	Arafura Sea 30 July 1942.	Unknown
23	RAAF Mitchell A47 – 1	1944	In sea near Peron Island.	Force landed
24	RAAF Mitchell A47 – 2	1944	In sea near Peron Island.	Crashed
25	RAAF P-40 Kittyhawk A29-59	1942	At mouth of Daly River 13 Nov. 1942.	Unknown
26	RAAF Sabre	1961	Talc Head, Darwin Harbour.	Mid air explosion
27	RAAF Spitfire A58-107 (EE-607)	1943	In sea off Adam Bay, Darwin 20 June 1943.	Unknown
28	RAAF Spitfire BE-162	?	Near Kings Table, West Arm, Darwin Hbr.	Gunfire
29	RAAF Spitfire BS-191	1943	12 miles south Pt Charles, near Pinic Point.	Unknown
30	RAAF Spitfire BS-536	1943	Wreckage in sea at West Point 2 May 1943. Shot down by Japanese aircraft – total of 15 Spitfires lost.	Shot down
31	RAAF Spitfire F.VC A58-9 (AR620)	1943	Into sea Darwin area.	Unknown
32	RAAF Spitfire F.VC A58-17 (BR-239)	1943	Into sea 20 miles SW Peron Island 2 May 1943. Shot down by Japanese aircraft – total of 15 Spitfires lost.	Shotdown
33	RAAF Spitfire F.VC A58-26 (BR-480)	1943	On beach 4 miles west of Pt Charles 3 May 1943.	Shot down
34	RAAF Spitfire F.VC A58-33 (BR-499)	1943	In Roper River 6 July 1943. Damaged in combat.	Shot down
35	RAAF Spitfire F.VC A58-34 (BR-526)	1943	Into sea about 30 miles NW of Darwin 2 May 1943. Shot down by Japanese aircraft – total of 15 Spitfires lost?	Shot down
36	RAAF Spitfire F.VC A58-58 (BR572)	1943	Near Charles Pt about May 1943. Shot down by Japanese aircraft – total of 15 Spitfires lost.	Shot down
37	RAAF Spitfire F.VC A58-89 (BS-225)	1943	Darwin Hbr area 2 May 1943. Shot down by Japanese aircraft – total of 15 Spitfires lost.	Shot down
38	RAAF Spitfire F.VC A58-92 (BS-231)	1943	Point Charles area 15 March 1943.	Shot down
39	RAAF Spitfire F.VC A58-66 (BS-171)	1943	Into sea, 70 miles west of Darwin 2 May 1943. Shot down by Japanese aircraft – total of 15 Spitfires lost.	Shot down
40	RAAF Spitfire LF.VIII – A58-310 (JF847)	1944	Darwin Harbour October 1944.	Unknown
41	RAAF Spitfire LF.VIII – A58-302 (JF820)	1943	In water 200 yards off main jetty	

			(Stokes Hill Wharf), Darwin Harbour.	Unknown
42	RAAF Venture A59-56	1945	Into sea off Brenner Island, near Gove, NT.	Unknown
43	RAAF Walrus W2755	1945	Into sea in Cape Don area 14 June 1945.	Unknown
44	RAF Spitfire VCB-K239	1943	20 miles SW from Peron Islands.	Unknown
45	RAF Spitfire VF-BX 480	1943	4 miles west of Point Charles.	Gunfire
46	RNAF Mitchell B-25 N5-133	1943	Pt Jahleel, Melville Island.	Unknown
47	RNAF Mitchell B-25 N5-140	1943	Bay between East Point & Nightcliff 5 April 1943.	Crashed
48	USAAF B-17 Flying Fortress	1942	Into sea 20 miles from Darwin 30 June 1942. (May be same reference as USAC Flying Fortress?)	Unknown
49	USAAF P-40 Kittyhawk '1'	1942	In Darwin Harbour 19 February 1942. 33rd Pursuit Squadron USAAF.	Shot down
50	USAAF P-40 Kittyhawk '2'	1942	Ditto	Shot down
51	USAAF P-40 Kittyhawk '3'	1942	Ditto	Shot down
52	USAAF P-40 Kittyhawk '4'	1942	Ditto	Shot down
53	USAAF P-40 Kittyhawk '5'	1942	Ditto	Shot down
54	USAAF P-40 Kittyhawk '6'	1942	Ditto	Shot down
55	USAAF P-40 Kittyhawk '7'	1942	Ditto	Shot down
56	USAAF P-40 Kittyhawk '8'	1942	Ditto	Shot down
57	USAAF P-40 Kittyhawk '9'	1942	Ditto	Shot down
58	USAAF P-40 Kittyhawk '10'	1942	Ditto	Shot down
59	USAAF P-40 Kittyhawk '11'	1942	Ditto	Shot down
60	USAAF P-40 Kittyhawk '12'	1942	Near Bremer Island off Cape Arnhem 14 March 1942. Hopelessly lost after a Japanese air raid on Horn Island.	Unknown
61	USAAF P-40E Warhawk '1'	1942	Bynoe Harbour.	Gunfire
62	USAAF P-40E Warhawk '2'	1942	Western reaches of Darwin Harbour.	Gunfire
63	USAAF P-40E Warhawk '3'	1942	Fannie Bay, Darwin Harbour.	Gunfire
64	USAAF P-40E Warhawk '4'	1942	Gilruth Point, Cox Peninsula.	Gunfire
65	USAAF P-40E Warhawk '5'	1942	Gilruth Point, Cox Peninsula.	Gunfire
66	USAAF P-40E Warhawk '6'	1942	Quail Island.	Gunfire
67	USAC B-17 Flying Fortress	1942	Near Gilruth Point, Beagle Gulf.	Crashed
68	USAC Kittyhawk P40	1942	Darwin Harbour.	Gunfire
69	USAC Liberator B24	?	South of Gun Point.	Unknown
70	USN Catalina 28-MNE (#41)	1942	East Arm, Darwin Harbour 19 Feb. 1942.	Gunfire
71	USN Catalina PBY-4 (#4)	1942	East Arm, Darwin Harbour 19 Feb. 1942.	Gunfire
72	USN Catalina PBY-4 (#8)	1942	East Arm, Darwin Harbour 19 Feb. 1942.	Gunfire
73	USN Catalina PBY-5 (#18)	1942	West of Bathurst Island 19 Feb. 1942.	Shot down

Appendix 3. Northern Territory Shipwreck Database: Other

Total Wreck #	Site Name	Date lost/ built	Location	How lost
1	*Beagle* anchors – HMS	1839	Victoria River, Northern Territory.	Abandoned
2	Bus Stop Reef	1991	Fenton Patches, 17 nm north-west Darwin.	Scuttled
3	Channel Island Leprosarium jetty	?	Channel Island, Darwin Harbour.	Unknown
4	East Arm Flying Boat Base jetty	1961	East Arm Flying Boat Base jetty.	Fire
5	East Arm RAAF fish trap	?	On point near the Lugger Maintenance Section base.	na
6	Freight containers x 2	?	Near Iron ore wharf.	Unknown
7	Lamaroo Beach Anchor	?	Lamaroo Beach, Darwin Harbour.	Unknown
8	Lee Point government reef	1999	Darwin Harbour NW of Lee Point.	Scuttled
9	Mystery Obstruction 1	?	Darwin Harbour: 12° 29.000S/130° 50.699E.	Unknown
10	Mystery Obstruction 2	?	Darwin Harbour: 12° 28.877S/130° 50.371E.	Unknown
	Night Cliff fish trap	?	Night Cliff, Darwin Hbr, report by AAPA, Darwin.	na
11	South Port jetty	?	At South Port community Haycock Reach, Darwin Harbour.	Unknown
12	Pipeline Reef	?	Beagle Gulf.	Scuttled
13	Woods Inlet jetty	?	Old sugar plantation, Woods Inlet, Darwin Harbour.	Unknown
14	Zuleika (coal deposit)	1886	Horseshoe Reef, 7 miles west of Grose Is.	Stranded

Endnotes

[1] The waters around Australian external territory, Ashmore and Cartier Island are also included in the NTSD.

[2] Dennis was the first to add aircraft and ‘others’ to the NTSD.

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The Baltic Sea and inland lakes: Underwater cultural heritage in Finland—management, underwater parks and current projects

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Figure 1. Egelskär site with a church bell made of bronze from the 14th century. Photo: Matias Laitinen, Maritime Museum of Finland.

Figure 2. The early 17th century Mulan wreck. Photo: Kalle Salonen, Teredo Navalis Club.

Introduction

Finland is situated between the two arms of the Baltic Sea, the Gulf of Finland in the south and the Gulf of Bothnia in the west. The Baltic Sea is a small intra-continental sea, and the largest brackish body of water in the world. Finland and the northern part of the Baltic were covered by the continental ice field during the most recent major Ice Age. In southern Finland the ice started to melt about 10 500 years ago and Finland was settled immediately after the Ice Age. However, there are signs of human activity before the last Ice Age dating back over 100 000 years. These remains of pre-glacial human activities, flora and fauna have been found in the Susiluola Cave ('Wolf Cave') in South Ostrobothnia in western Finland (Lähdesmäki, 1999: 177).

During the medieval and post-medieval periods, the Baltic was already one of the most important areas for European trade. This factor, combined with the treacherous and rocky nature of the Finnish and Swedish coastline and archipelagoes, was the main reason for the thousands of vessels sinking along the Finnish coast alone over the centuries.

The Baltic Sea is cold, dark and the level of salinity is low. The shipworm *Teredo navalis* does not exist in the Baltic, a factor that has contributed to the remarkable and unique preservation of organic materials. The condition of shipwreck material can vary from a pile of planks to vessels in a virtually undamaged condition. The most intact shipwrecks are often situated in waters deeper than 30–40 m, while the wrecks in shallower waters are likely to have been destroyed during storms, by salvage operations, or crushed by winter ice, particularly pack ice. In winter the Baltic around Finland's coast and the lakes and rivers freezes for several months. Even in winter conditions underwater archaeology continues as the ice makes some work easier and the visibility becomes much clearer.

There are some 647 rivers and 190 000 lakes in Finland, and many of the large lakes form interconnected systems which provide extensive inland waterways, and yield rich deposits of material culture.

The legal protection of underwater cultural heritage in Finland

Antiquities Act 1963

The antiquarian cultural heritage in Finland is automatically protected by the *Antiquities Act 1963*. According to this Act, shipwrecks, or parts of wrecks that can be assumed to be at least 100 years old, are protected. The Maritime Museum of Finland (MMF) must be immediately notified of the discovery of any old shipwreck, and other underwater cultural heritage. Underwater cultural heritage is dealt with in the same way as terrestrial archaeological sites. In the legislation, shipwreck sites are interpreted as non-movable cultural heritage.

The protection is supervised by the National Board of Antiquities which falls under the Ministry of Education and the Finnish Government. As a part of the National Board of Antiquities; the MMF is responsible for exercising control over the protected underwater sites (Fast, 1999: 187–188).

Figure 3. Preparations for winter diving under the ice at the site of the Mulan wreck. Photo: Sallamaria Tikkanen, Maritime Museum of Finland.

The finds of military material

According to the Act of 1983, concerning the finds of military material, all wrecked ships owned by the Finnish navy or the navies of other countries and found within Finnish territory fall under the supervision of the Ministry of Defence. The Military Museum is responsible for military shipwrecks younger than 100 years.

The Maritime Museum of Finland

The Maritime Museum of Finland is the smallest and youngest unit of the National Board of Antiquities. It is situated on the island of Hylkysaari, formerly the Helsinki Pilot Station. The Museum was founded as a maritime archaeological unit in 1968, and in 1981, a permanent exhibition was opened for visitors (Pelanne, 2000: 120).

The exhibition at the MMF presents the general history of Finnish seafaring and the history of boats and shipbuilding. At present, the exhibitions, maritime history, underwater research and the conservation of underwater finds are the Museum's main activities. The Museum also has both photographic and archive collections, and its collection of maritime objects include the museum lightship *Kemi* (built in 1901) and the museum steam icebreaker *Tarmo* (built in 1907, and located in Kotka) (Pelanne, 2000: 120–121).

In its official role as the government authority responsible for underwater finds covered by the *Antiquities Act*, the MMF is also responsible for issuing research permits for underwater sites, and for the provision of official statements concerning the effects of underwater construction projects. If an underwater archaeological site is going to be dismantled during a construction project, the developer must pay for the archaeological excavations. Furthermore, the MMF monitors those

Figure 4. The Utö Finnskär 'porcelain slope' from the mid 19th century. Photo: Veli-Pekka Paatero, Maritime Museum of Finland.

Figure 5. The wreck of *Kronprins Gustav Adolf* sunk in 1788. One of the over 70 cannon at the site. Photo: Mikko Enäkoski, Maritime Museum of Finland.

wrecks protected by the *Antiquities Act* in cooperation with the coastguard (Fast, 1999: 187–188).

In accordance with the *Antiquities Act*, the MMF keeps a register of all underwater finds. The register includes information on approximately 800 cultural heritage protected sites and finds from the sea and inland lakes and rivers. There are undoubtedly many more ancient sites than are presently known. Most of the underwater sites are wrecks, but there are also other types of underwater sites, for example old harbours, underwater defence constructions, prehistoric log-boats, beached shipwreck remains and 19th and 20th century steamships (Fast, 1999: 187188).

The MMF also maintains a register of traditional ships still in use and owned by private persons or associations. The aim of this register is to ensure the preservation and proper restoration of culturally and historically valuable ships. At the end of 1999, the register included 53 sailing, steam and motor vessels (Pelanne, 2000: 120–121).

Cooperation with the sport divers is an essential part of the work of the MMF. It has organised annual collaborative underwater field-work expeditions and inspection dives with sports divers. Underwater documentation recorded by the sport divers is a very important means of acquiring basic information about underwater finds. The MMF also offers lectures and courses in underwater archaeology for sport divers, the general public, and university students.

The MMF participates in maritime archaeological cooperation with other Baltic and Scandinavian countries. In addition, the Museum has participated in the work of the Common European Maritime Heritage Council and International Congress of Maritime Museums. The Maritime Museum of Finland cooperated with the Australian State Heritage Branch and Kristiinankaupunki Maritime Museum to organize an exhibition presenting the sailing ship Fides from Kristiinankaupunki, which sank off the Australian coast in the 1860s. The exhibition was opened in 1998 in Adelaide and in the summer 1999 it travelled to Finland.

Figure 6. Information signs for the underwater park at the *Kronprins Gustav Adolf* are prepared to be taken to the wreck. Photo: Sallamaria Tikkanen, Maritime Museum of Finland.

In May 2000, the MMF opened a temporary exhibition called 'Ships Lost at Sea'. The exhibition offered a journey through time as it presented over ten wrecks and stories of captains, ship's boys, naval soldiers and merchants from different eras and different areas. The exhibition was part of Helsinki's European City of Culture year. As a part of this exhibition the MMF opened the first underwater archaeological park in Finland at the wreck site of *Kronprins Gustav Adolf*, a Swedish ship of the line wrecked in 1788 outside Helsinki (Malinen, 2000: 116–117).

Underwater cultural heritage in Finland—some examples

More than 70 rock paintings are currently known to exist in Finland, and represent the oldest known graphic recording of boats in Finland dating from around 4000 BC to AD 500. They portray the hunting culture of the conifer forest zone, most of the figures depicting humans, cervids

Figure 7. Diver's plastic map for the underwater park of the *Kronprins Gustav Adolf.* Drawing Kalle Salonen, map Minna Koivikko, Maritime Museum of Finland.

deers and boats (Taskinen, 1999: 181–182). Underwater excavations in the lowest terraces in the foot of the Astuvansalmi rock paintings in a lake in the eastern part of Finland have revealed three amber pendants depicting human faces (Grönhagen, 19991: 84–86). A new class of underwater sites are submerged Stone Age dwelling sites in the lake district, mostly in the central parts of Finland (Koivikko, 2000: 4–11).

There is a foreseeable gap in the settlement pattern in the distribution maps concerning the earliest prehistory of Finland, the Mesolithic period. Due to the land upheaval, several lakes experienced a period of transgression. Hence, the mesolithic settlements situated near the beach-district, for example, were already covered by the rising water in prehistory. Research in this field has been carried out in recent years, and although the results are only preliminary, it seems that in Taipalsaari, for example, it is possible to find objects of quartz and organic material in the thick mud layers dating back to the Stone Age (Koivikko, 2000: 4–11).

Very little is known about the watercraft of the prehistoric era as no boats which can be dated with certainty to this period have been found. There are several log-boat finds in Finland but their dating has been a problem. However there are some confirmed late Stone Age paddles from central Finland (Vilkuna, 1986: 8–12).

Archaeological finds of boats in Finland using a sewn construction technique, number over twenty. The sewn boat of Rääkkylä dates back to a period between the years AD 1 000–1 270 (Naskali, 1986: 2–7). The sewn boat of Mekrijärvi-lake, in North Karelia, dates to the beginning of the 17th century. The boat is known as the 'five-piece boat' (Forssell, 1981: 2–9).

It is important to remember that maritime sites are found not only underwater but also on land. The boat cremation burial of Yliskylä, Perniö in south-western Finland is dated to the early 7th century and has yielded 850 boat rivets, swords, shields and other objects (Matikka, 2000: 111–113).

At Pukkisaari Island, Jaala, in the south-eastern part of Finland, a level-ground cremation cemetery from the Viking Age has been found. Part of the cemetery has fallen to the bottom of the lake. The site has uncovered a rich selection of grave finds, jewellery, weapons and utility articles (Miettinen, 1998: 135).

The best known ancient anchorage in Finland is probably Hauensuoli off Hanko, the most southern tip of Finland, which has been used since the 15th century (Edgren, 1997: 35–39). Other interesting old harbours are the Purunpää and Kyrksundet harbour in the south-western archipelago of Finland and the mediaeval Suojoki boat harbour in Keuruu in central Finland (Edgren, 1997: 35–39; Vilkuna, Taavitsainen & Forssell, 1993: 85–90). The Egelskär site, also in the south-western archipelago, consists of earthenware from the 14th century and a church bell made of bronze (Fig. 1) (Archives of the Maritime Museum of Finland). The many ancient harbours here, and along the south coast of Finland, follow an old sea route from Sweden to Finland and to Estonia.

The principal maritime archaeological materials in Finland are ship remains. The Lapuri wreck, in the

Figure 8. The wreck of *Vrouw Maria*. A sketch drawing based on the video material and initial measurements. Drawing Kalle Salonen.

eastern part of the Gulf of Finland, is dated to the 13th century according to the latest dendrochronological analyses (MMF Archives). The Lapuri wreck is a light, clinker-built sailing vessel, about 12 m long and almost 3 m in beam (Tikkanen, 1995: 183–194). An example of 16th-century wrecks is the Esselholm wreck, a Dutch merchantman containing a cargo of extremely well preserved 'Bellarmine' (beardman) pots, earthenware pottery and frying-pans (Halme, 1979: 61–70).

The early 17th century Mulan wreck (Figs 2 & 3), east of the Hanko peninsula, has been investigated and totally excavated by the Maritime Museum of Finland. The investigations have yielded approximately 600 artefacts. It has been dated by the coins and other material found in the wreck. The two church bells of the Russian faith found are a fairly certain indication that the ship was carrying 'war booty' to the west. The ship had arrived from the east, via the intra-coastal route, and sank just before arriving at the old Hauensuoli anchorage. The precise identification of the ship has not yet been determined (Sammallahti, 1995: 72–73).

The Ruotsinsalmi naval battle area is situated off the town of Kotka in the eastern part of the Gulf of Finland. This area was the setting for two naval battles in the so-called 'War of King Gustavus III', between Sweden and Russia in 1788–90. These two battles bequeathed to Finland a graveyard of warships (Mertanen, 1997: 72–73).

It has been said that Finnish underwater research was born and developed in Ruotsinsalmi, namely with the excavation work of the Russian frigate *Saint Nicholas* that was found in 1948. The vessel sank on 9 July in 1790 during the second battle of Ruotsinsalmi—the largest naval battle in the Baltic Sea. During side-scan sonar surveys conducted in 1992 and 1999 by the Kymenlaakso Provincial Museum, about twenty potential shipwrecks were discovered. Of these, about ten were previously unknown to the museum (Mertanen, 1997: 72–73).

The Utö Finnskär or 'porcelain slope' (Fig. 4) in the south-western archipelago is a single cargo site without a shipwreck. The site consists of English, Danish and Swedish earthenware from the 1840s and 1850s. The porcelain was probably on board the *Jatkaja*, which ran aground by Utö in October 1865, and some of the salvaged cargo was lost in the sea (Tikkanen, 1997: 66).

Archaeological investigations have also been performed on the remains of underwater defence constructions or barriers around mediaeval and post-mediaeval forts and in passages along the coast of Finland. In Helsinki around the Suomenlinna century island fortress, the underwater barriers can be divided into four categories:

1. Shipwrecks;
2. Small log frames filled with stones;
3. Long log frames filled with stones; and
4. A chain suspended between floats.

The barriers date mainly from the 19th century (Alopaeus, 1983: 17–24).

The most famous wrecks of warships younger than 100 years are the Russian minelayer *Ladoga* (ex-armoured cruiser *Minin*) from the World War I and the German minelayer *Königin Luise* (ex-passenger liner *Königin Luise II*) sunk in 1941. The Military Museum (under the Ministry of Defence) has been investigating these sites in co-operation with sports divers and the Navy Diving School (Melkko, 1995: 143–147).

The *Vrouw Maria*—a Dutch snow wrecked in 1771

The wreck of *Vrouw Maria* (Figs 8 & 9), a Dutch snow, was found in the summer 1999 using a side-scan sonar (SSPC 600 Khz/Marin Sonic Technology, USA) and documentary research. The search for the wreck—well known from archival research, was organized by the Pro *Vrouw Maria* Association. The wreck is located in 41 m (123 ft) of water and is almost intact (http://www.nba.fi/MUSEUMS/MARITIME/Vroueng.htm). The story of the *Vrouw Maria* has been investigated by Dr Christian Ahlström, a private researcher.

Vrouw Maria had left the port of Amsterdam in September 1771, carrying a nearly full cargo, and destined for St Petersburg. Part of the cargo consisted of some art treasures, probably paintings—belonging to the Russian Empress, Catherine II (the Great, 1729–96). Catherine was well known for her great passion for collecting art and she had ordered her Ambassador to the Netherlands to look after her interests at Gerrit Braamcamps art auction in Amsterdam. In addition *Vrouw Maria* carried ordinary merchant goods like sugar, cloth and dyestuffs (Ahlström, 2000: 13–16).

Before entering the Baltic, the ship had to pass the Customs of the Sound in Denmark. There was no another

Figure 9. The wreck of *Vrouw Maria* sunk in 1771. A loading port in the aft of the ship. Photo: Roope Flinkman, Maritime Museum of Finland.

way to enter or leave the Baltic except by using the channels through the Danish sounds. All ships passing the Sound had to pay certain customs dues. This practice started in the 15th century and continued until 1857, when US ships refused to pay the fees and other nations followed suit (Ahlström, 2000: 13–16).

The Sound Registers archives in Copenhagen in the National Archives of Denmark in Copenhagen allows us to study, by way of historical documents, almost the entire traffic of commercial ships through the Danish Sound from1490 to 1856. The Sound Register collection contains data on cargoes, skippers, destinations, ports of departure, etc. Today's historians have made considerable use of the meticulously kept notes left by the custom's authorities (Ahlström, 2000: 13–16).

The voyage of *Vrouw Maria* went well, but after reaching the mouth of the Gulf of Finland and the dangerous Finnish shoals and rocks it ran into trouble in the dark and stormy weather. The ship violently struck a submerged rock and lost its rudder. The crew managed to escape from the ship and later returned to salvage some goods and cargo. During one of their subsequent salvaging expeditions, the vessel could not be found: it had vanished in a storm (Ahlström, 2000: 13–16).

In July 2000 the Maritime Museum of Finland investigated the wreck of *Vrouw Maria* for two weeks. The aim of the field-work was to document the wreck through video filming and still photography.

There are several other equally well-preserved shipwrecks in Finland, amongst them the wreck of *St Michael*—a Dutch galliot-type vessel—sunk in 1747; the wreck of *Sophia Maria*—a Dutch koff—sunk in 1859; and the wreck of Trehålskär—possibly an English brig—sunk in 1873 (Ahlström, 1978: 59–70; Kehusmaa, 1982: 8–14; Tikkanen, 1997: 67).

Kronprins Gustav Adolf

The wreck of the *Kronprins Gustav Adolf* is situated in the Gulf of Finland outside Helsinki. The wreck is a Swedish 62-gun ship of the line that ran aground on an uncharted rock during the wars of King Gustavus III in 1788. Russian ships had chased the *Gustav Adolf* and captured it after it ran aground. They took its crew as prisoners and set the ship on fire. The wreck was found in 1995. The *Kronprins Gustav Adolf* was built in Karlskrona in Sweden in 1784 after the drawings by the famous naval architect Fredrik Henrik af Chapman (Tikkanen, 2000: 69–89).

Presenting the underwater cultural heritage

Underwater cultural heritage has traditionally been presented to the general public in museums, or even by the raising of whole shipwrecks. However, another option is to create so-called underwater parks where diving enthusiasts can follow underwater historical paths and become acquainted with the site. Along the rope-guided path, there are information signs explaining the structures and artefacts to be found in the wreck. The diving support vessels arriving at the park, moor at a buoy located outside the immediate area—avoiding having to anchor on the site, which could destroy the remaining fabric. In underwater parks, attempts are made to preserve the site in its original condition as far as possible, and to favour non-destructive techniques in the investigations preceding the foundation of the park (Tikkanen, 1997: 67–68).

As a part of the Maritime Museum of Finland's exhibition in summer 2000 'The Ships Lost at Sea', an archaeological underwater park, was opened at the wreck site of *Kronprins Gustav Adolf*. The wreck of *Kronprins Gustav Adolf* is a suitable site for an underwater park: it is open and in a stable condition without many loose artefacts. Even though the only remaining parts of the ship are the bottom and the fallen sides, some cannon (Fig. 5) and cannon balls, the wreck gives a good picture of the bulk and size of an 18th-century large ship of the line. Diving at the site is pleasant: visibility at the wreck, at a depth of 20 m, is usually 4–7 m. Divers can explore the wreck and its history in detail with the help of twelve information signs placed in the wreck (Fig. 6). Divers who visit the site can take a plastic site map (Fig. 7) and learn more about the site than from a paper brochure. The fact that there is a well-known story —published in the Annual Report 2000 of the Maritime Museum of Finland and connected with the *Gustav Adolf*—adds to the public's interest in the wreck (Tikkanen, 2000: 69–89).

Future

It is clear that one of the major questions in the future—and already today—is how to protect, manage, monitor and maintain the antiquarian monuments on land and underwater.

One of the basic principles of the ICOMOS Charter on the Protection and Management of Underwater Cultural Heritage, signed in 1996, has been to preserve the underwater cultural heritage *in situ*. The idea of underwater parks supports this principle. Experiences gathered from around the world show that underwater parks are an effective way to enhance the preservation of underwater cultural heritage.

In Finland, the National Board of Antiquities maintains about 300 specifically selected terrestrial *in situ* sites. This work involves the maintenance and repair of sites, planning for site use, implementation of the plans, and providing public information (Moisanen, 1999: 180–181). It is hoped that in the future it will be possible to provide similar public access to underwater sites.

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Does a market for heritage tourism exist?

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Introduction

Internationally, heritage tourism is recognised as a major growth area (Cossons, 1989; Zeppel & Hall, 1991; Martin & Mason, 1992; Waters, 1994; Light & Prentice, 1994; Page, 1994) and has been described as big business in both economic and entrepreneurial terms (Herbert, 1995; Bahaire & Elliot-White, 1999). Within Australia, people now seek to identify with the varied aspects of Australian culture and heritage. For example, the growth in Aboriginal arts, in particular, reflects both the emergence and assertion of Aboriginal culture, heritage, and identity in contemporary Australian society (Zeppel & Hall, 1991). The growing interest in heritage tourism has been reflected in tourism planning documents (e.g. the 1998 Douglas Shire Tourism Strategy), the establishment of academic journals (e.g. the *International Journal of Heritage Studies*) and the current nationally funded Heritage Trails program. However, for many regions across Australia, Leaver (2000) believes that the potential for economic development through the promotion of heritage tourism has not been fully realised. Leaver (2000) identifies two possible reasons for this. Firstly, this under-realisation may be due to demand associated problems. For example, Australia's natural and cultural heritage assets are not well identified and recognised by the public. In addition, these assets are not effectively interpreted and promoted by industry. Secondly, Leaver (2000) believes that supply side issues such as inadequate business skills, infrastructure, and accommodation, poorly developed regional tourism products, and a lack of coordination and linkages outside the local area or region to effectively link tourists with heritage products, may also be hampering the potential for economic development.

Leaver's propositions lead us to question whether a heritage tourism market exists, and if it does exist, is the nature of the product suited to heritage-based travel motivations. This paper reports on elements of four broader studies of tourist motivation and satisfaction with existing domestic tourism products, where heritage has been identified as an important attraction and motivation for travel. Our interpretation of the data lead us to support the views of Leaver (2000), and further propose that the quest for personal (and national) identity is an important motivation for travel that warrants greater understanding.

Background

Heritage tourism: defining characteristics

The heritage tourism literature is dominated by research centred in Europe (Balcar & Pearce, 1996). Although heritage is a universal phenomenon, to date the developed countries of Europe have made the most use of heritage tourism and have devoted the greatest effort to understand it (Ashworth & Larkham, 1994; Nuryanti, 1996). Aside from the academic debate as to what constitutes the term heritage, other key questions that have been raised in the literature relate to the role of heritage in a postmodern society, the interpretation and presentation of heritage products, the degree of visitor orientation, the role of education versus entertainment, the funding of heritage attractions, and the impacts of visitation (see Cossons, 1989; Hall & McArthur, 1993; Prentice, 1993; Alzua, *et al.*, 1998).

To date, little specific agreement exists on what constitutes heritage tourism. The word heritage has been employed in built, cultural, and natural contexts (see Yale, 1992; Zeppel & Hall, 1991, 1992; Hall & McArthur, 1993; Prentice, 1994; Nuryanti, 1996). For example, in the built arena, heritage has been used to describe material constructions such as historic buildings and structures. In the cultural arena, heritage has been used to describe physical forms such as monuments, historical or architectural remains and artefacts, or non-physical forms such as philosophy, traditions, significant events or personalities, and distinctive ways of life (culture). In the natural arena, heritage has been used to describe gardens, landscapes, national parks, wilderness, and mountains.

Pragmatically, Yale (1992) states that the fashionable concept of heritage tourism means nothing more than tourism centered on what we have inherited from historic buildings, to art works, to beautiful scenery. In a similar vein, Zeppel and Hall (1992: 47) view heritage tourism as a broad field of specialty travel, 'based on nostalgia for the past and the desire to experience diverse cultural landscapes and forms' (see also Browne & Fladmark, 1994). According to Prentice (1993: 22) heritage tourism should be regarded as 'a series of overlapping and somewhat ill-defined market places in which potential consumers seek to benefit internally through the beneficial feelings of 'consuming' heritage and producers present products for consumption as attractions'.

Others, though, have looked more closely at heritage, stressing the acculturation aspects of historical and other resources needed for objects or sites to be deemed

heritage. For example, Boniface and Fowler (1993: 158) comment:

> …because it [heritage] has no intrinsic meaning heritage has no existence either. Of course, it is there as bits of stone and mud, metal and wood, but it only becomes heritage when we give it a value-laden significance in anthropogenic terms. In other words, tourists go to see, not just artefacts but psychological artefacts, their meaning created differently and a million and more times over, in the minds of each and every one of us.

Thus, the definitions and use of heritage in the literature identify items from the past to be an inherent part of heritage. However, a line of thought exists that it also embraces interpretation of the significance of items and ideational concepts (Ashworth, 1990) relating to self and personal identity. White (1994) argues that Australia's heritage and tradition can be understood to be more than just 'things', however, historic buildings and unique locations have eluded appropriate and sensitive understanding on the part of many professionals in the tourism industry. As such, White (1994) states that it is little wonder that intangible (or conceptual) heritage and tradition-related elements of Australian culture has eluded both the tourism industry, interpreters, and the broader community as custodians.

Heritage tourism: Developing market profiles

Heritage tourism is becoming increasingly recognised as an identifiable sector (Cossons, 1989). Since the 1990s researchers have developed baseline demographic profiles and identified potential market segments as a basis for developing a better understanding of the heritage tourism market.

Demographic and segmentation studies

In a study exploring the heritage tourism market, Light *et al.,* (1994) described heritage tourists as people who are from the middle classes, well educated, middle aged, no children, on holiday away from home, and who have a prior interest in history. Exploring the regional variations in demand for heritage tourism in Wales, Light and Prentice (1994) found that demand varies among different groups of visitors and between sites. Specifically, the study identified distinct variations reflecting both site-specific factors (e.g. local versus non-local visitors) and regional patterns such as variations in demand between sites located in north and south Wales. In contrast, Balcar and Pearce (1996) found that while the level of demand varies from one site to another, differences in profile and other visitor characteristics appeared less pronounced. Overall, they found that heritage tourists tended to be middle aged and well educated.

In very general terms, Prentice (1993) segmented the heritage tourism market into five predominant groups: educated visitors, professionals, families or groups, school children, and nostalgia-seekers. More recently, a study by Alzua *et al.* (1998) exploring the cultural and heritage travel experiences of international outbound travellers from the United Kingdom, identified five distinct travel segments:

- family resort/sunbathing (31.2%);
- heritage/middle aged/family (23.9%);
- heritage/younger/backpacker 16.4%);
- older/urban heritage 15.7%); and
- visiting friends and relatives (VFR) 12.8%).

These five groups differ in their behavioural patterns, demographic composition, attitudinal dimensions and travel characteristics. Three of the five segments (heritage/ middle aged/family, heritage/younger/ backpacker, and older/urban heritage) placed significant emphasis on the availability of heritage and cultural attractions and events. Based on these findings, the three market segments interested in heritage related experiences make up a significant proportion (56%) of the total tourism market.

Although demographic studies are useful for developing basic consumer profiles, they are unable to provide an in depth understanding of the dynamics underlying consumer behaviour. Recently, researchers have begun developing more detailed consumer profiles using satisfaction and motivation.

Satisfaction and motivation studies

In a study designed to assess visitor satisfaction across eight heritage sites on the west coast of New Zealand, Balcar and Pearce (1996) measured a number of individual aspects of visitor experiences. The study reported generally high levels of satisfaction among visitors to the eight sites, both in terms of the experience and individual factors such as interpretation, authenticity, access, and presentation. When the same respondents were asked what they felt to be the main function of the historic sites and centres visited, 30% answered it was to 'show and know' the past, 23% believed it was to educate, and 11% answered to preserve and conserve ruins, buildings, and historical artefacts.

Although heritage tourism is identified as a growing market, the underlying motivations influencing consumer demand are poorly understood (Prentice, 1993; Mullane & Breathnach, 1994). Underlying this lack of understanding is what some authors have described as 'imprecise motivations' or motivations that are difficult to conceptualise. Writing on this subject Darvill (1987: 167) states that:

> …the past means different things to different people, and many consider the presence of the past as somehow improving the quality of life. Beneath this general concept, however, there is a rather more fundamental trait of human nature which attracts people to ancient monuments. Understanding, exploring, and conquering the mystery of

> the past, and seeking answers to the questions posed by ancient monuments…is something in-built in human nature. For many people, the remains of the past provide a sense of security and continuity in an uncertain world, a thread of timelessness running through a rapidly changing environment.

In rediscovering heritage, people are seeking nostalgic experiences representing the way things used to be. This increased emphasis on retrospection, whether due to a psychological need for continuity, the desire to transcend contemporary experience, or the urge to better understand one's cultural roots has characteristically lead to some form of appreciation and concern for the past (Konrad, 1982).

In an attempt to better understand consumer choice, and ultimately, behaviour, researchers have begun to explore the motivations for heritage-based travel. Visitor surveys in Wales show that tourists visit heritage attractions out of general, rather than specific interests, or to enjoy sightseeing, with an interest in archeology, architecture, and culture (Thomas, 1989). The dominance of sightseeing and a general interest has also been found among tourists' reasons for visiting attractions on the Isle of Man (Prentice, 1993) and heritage attractions on the west coast of New Zealand (Balcar & Pearce, 1996). Similarly, American visitor surveys indicate that the atmosphere and ambiance associated with historic buildings provides an important motive for attendance, even more so than a particular interest in history (Mawson, 1984).

For many tourists a general desire to see sights or to become aware of a destination's heritage is sufficient motivation for their visit to a heritage attraction. Such motivations set the context for attraction managers to supply products to benefit their consumers. However, the dimensions of how tourists seek to benefit from visiting attractions have not been sufficiently researched. How far heritage attractions meet a desire to increase personal understanding as a recreational experience is still largely unknown (Prentice, 1993).

Heritage tourism offers opportunities to portray the past in the present. It provides an infinite time and space in which the past can be experienced through the endless possibilities of interpretation. Nuryanti (1996) believes that tourists use their intellect and imagination to construct their own sense of historic places to create their individual journeys of self-discovery. Tourism's images of nationhood thus provide individuals with another means by which they can understand who they are and where they have come from. But how well are these connections being made? How satisfied are the tourists with the experiences provided? Have their expectations been met or is there a mismatch between the product and the consumer?

Methodology

The data presented in this paper have been extracted from four independent Australian studies. Although the studies vary in scale, scope and purpose, each study supports the notion that Australian heritage is both an attraction and motivation for domestic travellers. An outline of the methodology underpinning each study is presented below.

Croydon Visitor Survey

Croydon is a small country town in the 'Gulf Country' of north Queensland. The township is approximately 550 km by road south-west of Cairns, and 151 km south-east of Normanton. In the early 1900s it was a thriving mining town. As part of a strategy to diversify the economic base of the shire, the local council sought to clarify tourist and community perspectives and expectations of the visitor experience, and tourist interactions respectively. In August 2000, day and overnight visitors (n=82, day visitors 46%) were surveyed on a mechanical sampling basis: the second person after completion of the street survey and every second camp in the campground. The sampling resulted in the median age group surveyed being 55–64 (40%) and a 5:4 ratio of males to females. That is, the sample is skewed towards older travellers and slightly towards males. Comparison using Chi Square analysis of responses to related questions of the overnight visitors and day visitors revealed no significant difference ($p = < 0.05$), so the data were merged for the purposes of this paper. Apart from obtaining expenditure patterns and a demographic profile, the survey sought responses to questions on motivations to visit Croydon, satisfaction with the visit experience, and a response to heritage interpretation signs recently erected around the township.

Senior Travel Market Survey

A study of Queensland seniors was undertaken in 1999 to profile their travel behaviour according to their demographic and psychographic characteristics, and to identify the types of services, products, and facilities most desired by senior travellers (see Clever, *et al.,* 1999). The sample was selected randomly from a database of Senior Card and Senior Discount Card holders maintained by the Office of the Ageing in the Queensland Department of Families, Youth and Community Care. In total, 370 000 Senior Card and Senior Discount Card holders are listed on the database. There are approximately 2.3 million Senior Card holders throughout Australia, representing eighty per cent of the total senior population. Of this percentage, Queensland Senior Card holders represent sixteen per cent. In this study, 3 000 seniors aged 60 years or older received questionnaires inquiring about their travel preferences, motivations and behaviour. Within one month of mailing, 1 203 questionnaires were returned: a response rate of 40%. To determine whether the non-response rate biased the results, non-respondents were compared to respondents in terms of age, gender, and

income, and no significant differences were found. The sample was therefore judged to be representative of the population of interest.

Newspoll® Telephone Omnibus Survey

In 1996, Newspoll® Market Research conducted a telephone omnibus survey to investigate travel preferences in the Australian domestic tourism market (see Horneman, 1999). The telephone survey was conducted among 850 respondents aged 18 years and older. The surveys were conducted in Queensland, New South Wales and Victoria. Combined, the three eastern states represent 77% of Australia's population (ABS, 1997). The respondents were selected using a stratified random sampling procedure with three steps. The first was to establish a quota set for each city and non-city area within each state. The quota set approximated the geographic adult population distribution while ensuring that the smallest areas were represented with a sufficient sample base for accurate analysis. Second, within each of these geographical areas, household telephone numbers were selected by a computerised process from current Telstra telephone directories covering the entire area. Random numbers generated from a computer program were used to select a directory page number, a column number, and then a name. The number of households selected in each directory was in proportion to the population represented within its coverage area. This system ensured that each area is represented in the final sample in proportion to the size of the telephone directory, and thereby its population. Lastly, the above geographical quotas were then subject to a further quota of 50% male and 50% female in proportion to the actual adult population.

Within each contacted household, a particular individual, male or female according to the quota being filled, was selected at random by a last birthday screening question. This ensured a further level of randomness within the sample. To further ensure that the selected respondents reflected the known population distribution, respondents were weighted using the discriminators of age, sex, area, and age left school to reflect the actual population distribution as reported by the Australian Bureau of Statistics from its latest census data.

Focus Group Study

As part of a larger study investigating the motivations guiding holiday preference and choice in the Australian domestic tourism market, focus groups were conducted to identify push (socio-psychological factors) and pull (destination attributes) travel motivations (see Horneman, 1999). Twelve focus group discussions were held with six groups in Brisbane, Queensland and six groups in Sydney, New South Wales. Each group session contained seven or eight participants. In total, 90 individuals participated in the study. Participants were conveniently and systematically selected following a purposive methodological design. Professional recruiting agencies were contracted to recruit participants from specially compiled participant data banks. Prospective participants were randomly selected from the data banks and then contacted by phone.

The interview guide was semi-structured and followed a standardised design. Focus group sessions followed a consistent procedure and explored a set of topics and used questions that applied to all twelve groups. The focus group discussions were held in professional settings. Locations were equipped with observatory and recording equipment. The focus groups were recorded on both audio and videotapes.

Results

In presenting results of the studies that are relevant to this paper, we have included a brief interpretation of the results. This has been done to highlight issues we seek to draw on in the discussion where we interpret the implications of the combined data sets.

Croydon Visitor Survey

In response to an open ended question on the main reason for visiting Croydon, nearly 30% said they were simply passing through (Table 1). This response reflects a general lack of awareness of Croydon as a destination: tourism is in its exploration phase (see Butler, 1980). However, half of the respondents volunteered either to see the Gulf Country or to experience outback culture as their reason for visiting. In contrast, no respondents identified the natural environment or Aboriginal culture as being the principal reason for visiting. This combination of responses suggests a motivation to travel that is not simply driven by attractions.

Reason	**No.**	**%**
Passing through	23	28.8
To see the Gulf country	22	27.5
To experience outback culture	18	22.5
Part of a tour package	8	10.0
I have work here	6	7.5
To see the area	3	3.8
Visitng friends and relatives	1	1.2
Other	1	1.2
Natural environment	0	0.0
Aboriginal culture	0	0.0
n	82	

Table 1. Reasons for visitng Croydon.

When asked to nominate the highlights of their visit to Croydon, 67% responded with a heritage place or history related experience. Of the 17 non-prompted responses, history and the heritage tour were identified, along with seven specific heritage places or 'old buildings' as a collective (Table 2). While this response reflects the character and features of the town, it again suggests that visitors notice and are responsive to built heritage features.

When asked to rank the most interesting aspect of their visit from a choice of five, around 90% of respondents nominated heritage sites, and history and heritage in their top two. Fewer than 10% placed the natural environment in the top two (Table 3). Again these data suggest a specific interest in history, outback heritage and heritage sites, ahead of landscape features and natural history.

When asked about the heritage interpretive signs, about half of the respondents had noticed them. If noticed, 93% read at least one and 65% read three or more. When asked their opinion of the signs on a 5-point Likert scale from a given choice, there was a consistent positive response (Table 4). Apart from indicating a positive response to the interpretive media and possibly the quality of the interpretation itself, the highly positive response to increasing enjoyment and understanding, plus the indication that visitors proactively sought out more of the heritage interpretation signs, again suggests an inherent interest in the history of outback places.

Highlight	No.	%
Pub	15	17.9
Old buildings	14	16.7
General store	8	9.5
History	8	9.5
Friendly people	8	9.5
Lake Belmore	7	8.3
Heritage Tour	6	7.1
Court House	4	4.8
Park area	4	4.8
Climate	4	4.8
Only stayed for lunch	3	3.6
Cemetery	3	3.6
Mines	2	2.4
Sport facilities	2	2.4
Lamps	1	1.2
Rodeo ground	1	1.2
Golf course	1	1.2
n	91	

Table 2. Highlights of the visit to Croydon.

	Ranked first (n=80)	Ranked second (n=66
History and heritage (n=70)	44	48
Heritage sites (n=72)	43	44
Natural environment (n=62)	8	0
Rural lifestyle and culture (n=62	5	8
Other (n=1)	1	0
Rural industries (n=56)	0	0

Table 3. Ranking of the most interesting aspect of visit (%).

Senior Travel Market Survey

Of the twelve holiday attraction types investigated, seniors preferred visiting areas with a natural or rural setting and historical context rather than attractions with a more developed focus (Table 5). Unlike the respondents from the Croydon survey, senior travellers are interested in both natural and heritage based attractions. Although nature based attractions received the highest rating, just over half of the respondents (52.9%) thought heritage was an important holiday attraction. With arts and other cultures, and indigenous cultures, these data suggest that heritage, in all its forms is an important tourist attraction.

The Newspoll® survey revealed that over three-quarters (77%) of the domestic market desire some level of history/ heritage as part of their holiday experience. Perhaps more revealing is that 42% of the market are strongly motivated to experience a piece of Australia's history and heritage. Again these results support the earlier findings that heritage is not only an important attraction, but also an influential motivation guiding holiday choice.

Focus Group Results

The discussion of results to this point has tended to focus on the importance of heritage as a product or attraction. While it appears that heritage based sites/attractions have a relatively strong appeal in the domestic tourism market, the motivations influencing the desire to experience Australia's heritage is little understood. The focus group results provide some insights into better understanding the underlying motivational drives.

The focus group data suggests that heritage is an important pull motivation influencing the choice of a holiday destination. During the group discussions, the desire to experience a part of history and heritage was

Prompted opinion	%
Increased enjoyment	97
Increased understanding of heritage	89
Croyden should be proud	87
Were not boring	86
Looked for more	84
More required	76
Not too much information	73

Table 4. Opinion on the interpretive signs.
N.B. Percent of respondents (n=38) who agreed or strongly agreed with given statements on a 5-point Likert scale.

Attractions	**Related important or very important (%)**
Beaches, lakes and rivers	68.3
Quiet countryside	64.2
Natural wilderness	57.6
Historical sites	52.9
Guided tours	38.9
Shopping	29.4
Arts and other cultures	27.1
Special events and festivals	23.6
Sports and recreation	20.2
Indigenous cultures	19.8
Big cities	17.9
Nightlife and entertainment	8.6

Table 5. The importance of holiday attractions to seniors.

often described as the search for the lifestyle of a previous era. In other words, nostalgia was a strong motivation for travel. Several comments made by focus group participants illustrate the importance of heritage as a motivational pull factor:

> "I like going on holidays for historical reasons, like going to Glen Rowan or something like that, to see Ned Kelly country, I like to learn about our history and culture."
> "I like old buildings. I like to go to places that have history and heritage. I love nostalgia. I want to protect old buildings like we protect the natural environment…I'm not interested in modern buildings, preserving history is important."
> "Ghosts…the spirit of a place, the sensation of what's gone on in the past, feelings of who's been there. Ghosts, history, who's been there, what life was like two hundred, two thousand years ago."
> "I like old homes, they have a lot of character and charm about them. We need to look after these things more, there are not a lot around, not like in Europe and those sorts of places".
> "When I go on holidays I always find a local museum or a historical society, I like learning about the old days. It's good to know there are places too that can tell you what happened, otherwise our kids will grow up not knowing how our heritage developed."
> "Exploration…I like history and I'm very interested in learning about Australia's history, its geological formation and what Australia has out there in the bush."
> "Pubs conjure up old characters. I like a drink but I prefer a drink when there are some old characters. Something that's not plastic…a chance to hear stories and learn about the days gone by…"
> "I enjoy history…somewhere like Port Arthur, I don't know why, I just enjoy it, I suppose some of it is nostalgia, I don't know…"

A closer examination of the comments presented above reveals three underlying motivational drives arising from the need to experience a piece of Australian heritage and history. The first and what could be described as the most dominant drive is what appears to be a quest for self and possibly, national identity which participants described as a search for the lifestyle of a previous era. This desire was often fulfilled by visiting places or sites of historical significance, particularly old buildings. Aside from visiting historical sites, the search for identity can also be met by meeting, talking and listening to people who have connections with the past. Often such people are found in pubs telling stories, and who typify the 'old Australian characters'. The second drive is the need to be educated or learn about our cultural background. The comments illustrate that a strong desire exists for people to better understand their cultural heritage and roots. The third drive is fantasy orientated with participants expressing the desire to imagine what could have been or what may have happened at the places or sites visited. The comments illustrate that people like to fantasise about the intangible elements such as the myths, stories, or past events that have occurred at the places visited.

Discussion

While none of the data-sets reported here were developed to explore the significance of heritage to tourism, collectively they provide insight, through 'triangulation', to questions relating to the potential of heritage places as tourist attractions, and history and heritage as a travel motivation.

The Croydon, seniors, and Newspoll® data strongly suggest that heritage is an important travel motivator and that heritage sites are important attractions, at least in some areas. The other data-sets support this interpretation. The findings from this paper suggest that a heritage market exists in the 55 years plus age group. This demographic profile is consistent with findings from previous studies (see Light *et al.*, 1994; Balcar & Pearce, 1996) it appears.) which describe heritage tourists as mature aged travellers. This age grouping includes more than 5 million Australians (around 20% of the current population), destined to be a third of the population by the middle of this century (ABS, 1999). Clearly, this market is neither small or elitist, and more importantly, is based on the demographic that has the time and financial resources to travel.

Similar to the findings of previous studies (e.g. Alzua *et al.*, 1998), the studies reported in this paper also suggest that the heritage tourism market in Australia is significant in size. This challenges the perspective that the Australian tourism market is preoccupied with destinations that offer sun and surf. Accounting for this apparent inconsistency, we propose that rather than the market being an artefact of the methodologies used, we believe that the market is real, but latent. In other words, the motivation exists, however, the products and services either do not exist or do not satisfy.

Heritage resources are poorly marketed, mainly because, in the Australian context, they are rarely grand (Grimwade & Carter 1999), and access to many is difficult, especially if the basis of the market is the mature traveller. These are immediate impediments to exploiting a heritage market. However, this is probably only part of the reason for the heritage market not being captured. We propose that the problem of tapping the market relates to the nature of the product currently offered and the real motivations of heritage tourists.

The Croydon data identified the romantic notion of 'outback culture' as a reason for travel. While physical structures were highlights, the ideational element of history was also identified. This was repeated in what visitors found most interesting: the concepts of 'history and heritage', supported by 'sites'. The focus group data also highlights that people speak of 'old buildings' as an attraction, but invariably place these in the context of emotive, abstract, and indeed romantic ideas of history, lives past and the 'good old days'. To support this quest for 'nostalgia', the focus group data identifies a desire to 'learn' about the lives of people who once were associated with a place. The positive response to heritage interpretation at Croydon can be seen as a behavioural reflection of this desire. Consistent with the earlier propositions made by Boniface and Fowler (1993) and White (1994), our data suggests that it is both the intangible and tangible elements of a heritage experience that consumers are seeking. In other words, the importance of the heritage icon does not lie in the actual artefact itself but within the interpretation.

Heritage tourism is a powerful force in the construction and maintenance of a national identity because it relies on the historic symbols of a nation as a means of attracting tourists (Palmer, 1999). The relationship between nationalism and heritage conservation has led to the creation of place-specific identities, built around the glorification of historical artefacts (Ashworth, 1994). Thus, the tourism industry, through the use of 'our heritage' becomes yet another means by which contemporary concepts of nation-ness are defined. As the focus group comments illustrate, national identity is a very personal construct as individual's draw upon the differing identities available to them in order to construct their own sense of who they are and how they fit in. The tourism industry, through its packaging of selected symbols of identity as 'our' heritage (e.g. the outback, the bush, the Stockman's Hall of Fame) is an example of what constitutes our national identity. While these attractions are interesting in their own right, it seems that the industry has been preoccupied with the tangible or physical elements with less focus on the intangible aspects. Our data suggests that tourists seek both tangible and intangible elements for a satisfying experience. If the tourism market is to capitalise on the many opportunities offered by heritage tourism, the benefits consumers seek need to be better understood so that heritage based tourism products are designed with such insights in mind.

Conclusion

While Australia is rich in Aboriginal heritage sites, it is not endowed with the grand heritage places of Europe or the spectacular temples and structures of Asia; nor does it have the mysterious ruins of South America and Africa. Much of its non-indigenous heritage resource is scattered across the country and remains most in tact away from the coastal centres in the form of shearing sheds, old mining towns, pubs, fences and rusting equipment. These things, in themselves, are not inspiring or romantic, but their context and the stories that go with them are, at least for a white population searching for an identity or attempting to capture what it means to be an Australian. The 'Crocodile Dundee' phenomenon and the Australian response to the opening ceremony of the 2000 Sydney Olympics, that made icons of the mundane, suggest that there is another dimension to heritage other than 'things'. The dimension is an abstraction that cannot be found without context and the stories of people. In this sense, the physical component of heritage is merely part of the context and the focus; less important than the story of everyday people associated with the physical item.

For heritage tourism then, the product is an idea attached to a place, structure or artefact. For this reason, museums and re-creations in regional Australia, where items are removed from their context, are anathema to the heritage market and do not attract or satisfy a market

seeking something more spiritual and meaningful. In contrast, places, buildings, structures and artefacts that are protected *in-situ* and interpreted in terms of real people that were associated with these resources are the products sought.

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Heritage, tourism and integrity—making it work

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Introduction

This paper examines some of the issues that arise when heritage and tourism intersect, and briefly discusses two recent Australian projects which take different approaches but which both offer guidelines for achieving the economic benefits of tourism while respecting the principles of heritage conservation and management..

Heritage, tourism and the marketplace

'Heritage' as a term referring to places and objects in the public domain is a relatively recent arrival, emerging in Europe and Australia in the 1970s (Davison, 1991; Richards, 2000). It is now used to refer to places, to objects or artefacts and indeed to 'all accumulated cultural and artistic productivity, frequently whether produced in the past or currently' (Tunbridge & Ashworth, 1996: 2). It has also come to include aspects of the natural environment which are survivals from the past or seen as in some way typical or original. It incorporates archaeological sites and objects that make their way from these sites into museums or other collections.

Throughout the 1980s heritage was used increasingly for commercial purposes. Places with natural or cultural heritage associations were increasingly promoted as attractions for visitors. Interpreting places and 'themes' moved from a fairly straightforward process of conveying information through signs and brochures to elaborate interpretative centres and costumed re-enactments. 'Heritage' arts and crafts have entered the market place as souvenirs for visitors who want to take home something that has special associations with a particular region or culture.

Heritage tourism in Europe is now a major industry; it is a significant part of the global tourism demand and of the advertised tourism product around the world. Collecting cultural and heritage experiences 'has become part of the wider consumer culture' (Richards, 2000: 15).

By the early 1990s, English author Richard Prentice could write in a matter of fact way that:

> For both the public and the private sectors a nation's or community's heritage is no longer of intrinsic worth only, it has become a resource from which employment and capital accumulation may flow (Prentice, 1993: 222).

This statement neatly encapsulates one of the central tensions of heritage tourism—between conservation of intrinsic worth (or heritage value) and exploitation as an economic resource?

The commercialisation of heritage has been accompanied by lively discussions of issues such as the separation of history from heritage; the effect of commercial exploitation on heritage resources; whether the past can ever be accurately presented; what constitutes a 'cultural resource'; loss of cultural identity and the pressures on some cultural groups to resist change so that attractive 'heritage' customs can be maintained (see for example Lowenthal, 1985, 1998; Tunbridge & Ashworth, 1996; Richards, 2000; Davison, 1991; Nicholas & Andrews, 1997). With the growth in consumption of heritage and culture as tourism product, there has also come growing concern about the impacts of tourism on the environments, sites and cultures it consumes. Calls for 'sustainable tourism', 'responsible tourism' and 'ethical tourism' have become a familiar part of the background noise of both heritage and tourism forums around the world.

Australian use of the term 'heritage' has followed a similar path to that taken in Europe and the United States. While cultural heritage and tourism have had a less obvious relationship here than they have in Europe, travellers in Australia have been interested in exploring places with historical associations or areas of natural beauty since the middle of the nineteenth century. Heritage began to enter the marketplace here in a significant way in the 1970s as awareness of heritage grew and Australian tourism was beginning to take shape as a major leisure and economic activity at the same time (Davison, 1991; Richardson, 1999).

As the links between heritage, sense of place and identity have become more widely recognised over the last ten years, there has been increasing interest in presenting heritage as tourism product to both the domestic and international marketplaces in Australia. These 'products' include museums, historic buildings and places, theme parks, national parks, gardens, Indigenous cultural sites, archaeological sites and heritage trails. They form a central part of the image and perceptions of their towns, cities or regions as tourism destinations and can appear in regional brand names such as the 'Shipwreck Coast' (Victoria) and the 'Copper Triangle' (South Australia).

Cultural tourism or heritage tourism

Heritage, culture and tourism are all complex concepts that are defined in many ways. The definitions offered here cover most of the key concepts involved in the terms that combine them as 'cultural tourism' and 'heritage tourism' as they are currently used in Australia.

'Cultural tourism' has been on the active agenda in Australia for at least a decade, yet there is still uncertainty about what it actually means (cf. discussion in Foo & Rosetto, 1999). If we use the sort of definition offered in *Creative Nation* (Commonwealth of Australia, 1994), we can see that it aligns fairly closely with what many people seek from travel:

> Cultural tourism embraces 'the full range of experiences visitors can undertake to learn what makes a destination

> distinctive—its lifestyle, its heritage, its arts, its people—and the business of providing and interpreting that culture to visitors.

This emphasis on *experience* is an important one (Zeppel & Hall, 1991: 31; Crinion & Leader-Elliott; Blamey, 1995), and has been influential in thinking about culture and tourism since the mid 1970s, when MacCannell (1976: 10) wrote that:

> All tourists desire this deeper involvement with society and culture to some degree; it is a basic component of their motivation to travel.

In Australia, heritage tourism is usually regarded as a subset of cultural tourism. In some cases it is given a particular emphasis on recognised heritage places. The Australian Heritage Commission (1999), for instance, views heritage tourism as involving

> …activities and services which provide domestic and international visitors with the opportunity to experience, understand and enjoy the special values of Australia's natural, indigenous and historic heritage.

Heritage tourism has also been described as 'an encounter with or an experience of being part of the history of a place' through visiting historic places, buildings and landscapes. It often has an emphasis on learning and includes 'the experience of local traditions, social customs, religious practices and cultural celebrations' (Zeppel & Hall, 1992).

Greg Richards' recent review of European cultural and heritage tourism (Richards, 2000: 9–10) suggested that heritage tourism

> …is largely concerned with the cultural legacy of the past, or the "hard" cultural resources usually contained in old buildings, museums, monuments and landscapes or represented and interpreted in specialized 'heritage centres'.

He also noted that heritage can cover many aspects of living culture, as well as the cultural and natural past. In traditional cultures the heritage of the past may also be a living element of contemporary society. The dynamic and diverse cultures of Australia's indigenous peoples are a good example of this.

Current issues and trends

Whatever the intricacies of defining heritage tourism, there is no doubt that it entails putting valued aspects of history, culture and natural environment into the marketplace as 'experiences' for consumption. The heritage of a place contributes to its appeal as a tourist destination and can lead to the development of a whole range of spin-off products such as heritage trails, guided tours, theme parks, recreated villages, themed events and so on.

Cultural heritage may not be the only, or even the main reason for travel, but it is often an important secondary reason for selecting one destination over another and in extending length of stay.

Most people visit heritage attractions as part of a wider itinerary and general recreation or sightseeing activities. Only a minority of visitors to heritage attractions have a specific interest in the attraction or its subject matter, or a special interest in heritage or culture (Leader-Elliott, 1996: 12; Laws, 1998; Prentice, R., 1993; Foo & Rossetto, 1998, Weiler & Hall, 1992). A Bureau of Tourism Research survey has shown that those international visitors to Australia who have the time or connections to learn what is available here culturally are the most likely to form a specific interest in attending a particular event or site (Foo & Rossetto, 1998: 3. That is, those most likely to be interested in visiting specific cultural or heritage attractions are those who are here for a longer time and have the opportunity to learn about what is available from others—either friends and relatives or other travellers with whom they exchange news.

In his recent review of trends in European heritage tourism, Richards notes that the numbers of visitors to cultural attractions who have a general interest in culture are growing more rapidly than those of visitors with a specific cultural motive. As this trend continues, he anticipates that the cultural market will extend towards mass tourism 'through the opening of new popularized cultural and heritage attractions' (Prentice 1993:75,79; Richards, 2000: 14). Richards notes that the nostalgia-driven heritage tourism boom of the 1980s 'has been replaced by a more pragmatic vision of the need to utilize the legacy of the past to stimulate contemporary production as well as consumption' (Richards, 2000: 14).

There has been insufficient research in Australia for us to say with any confidence why different groups of tourists visit different heritage attractions. Statements that visitors to heritage places are motivated by nostalgia for a rosier past, pursuit of ethnic identity or a desire 'in Australia to replace the curse of recency and to forge indigenous pride' (cf. Lowenthal, 1998: 6. Lowenthal apparently intends 'indigenous' to mean 'Australian national'; Richards, 2000: 11; Davison, 1991: 4–5) are all very well in the abstract, but they do not help us to understand why people visit particular heritage places or museums, what images they have of them and how these motives and images vary between different types of attractions and different parts of the country.

In Europe, cultural visitors are identified as well-educated, skilled consumers 'for whom the pursuit of culture is a form of personal development' (Richards, 2000: 11). International visitors to cultural attractions in Australia are mostly seeking an opportunity to experience something Australian, new or educational during their stay (Foo & Rossetto, 1998: 2).

At national level and in some States, heritage is being discussed as an opportunity for the development of tourism in regional Australia. There is increasing interest in heritage trails and interpretation projects. For instance, the

Australian Heritage Commission is very keen to develop heritage regional tourism plans (King, n.d.). Queensland is developing a Heritage Trails Network in partnership with the Commonwealth and local government, communities and businesses. This very ambitious project is developing several long distance trails based on heritage themes and designed to draw visitors into the more rural and remote parts of the State that are off the main existing tourist routes. The trails will link historic sites, museums, cultural centres and natural heritage places (King, n.d.).

The Northern Territory *Strategy for the Tourism Drive Market* recommends that selected road networks should be designated as tourist drives 'with internationally appealing themes and logos'. Their aim is to 'help bring the open spaces to life through vivid and imaginative interpretation of the significance of the landscapes, the roles played in human endeavours to survive and progress and the inter-relationship of the elements that make up the Outback' (Northern Territory Tourist Commission, 1996: 4). The Explorer Highway, following the route of the Stuart Highway is the first to be developed. Another following the route of the old Ghan Railway is nearing completion. Both of these interpretive projects have been planned cooperatively between the Northern Territory and South Australia. South Australia is also planning a network of coastal trails that will combine natural, historical and Indigenous heritage interpretation and will include maritime as well as land-based heritage. South Australia already has eight underwater heritage trails, the most recent of which is the 'Southern Ocean Shipwrecks Trail'.

Western Australia is moving ahead with the multi-million dollar Golden Pipeline project to interpret the Mundaring–Kalgoorlie pipeline that supplied water to the Western Australian goldfields. Victoria has themed trails through the Central Goldfields regions and following the routes taken by explorers such as Mitchell. The Office of National Tourism has funded overseas study trips to identify the critical success factors for trails and tourist drives.

While new projects such as these are attracting funds, allocation of resources to maintain and upgrade existing heritage places is seriously deficient. This situation is unlikely to improve as the Commonwealth Government moves towards the New Heritage Regime announced in 2000, and as the Commonwealth encourages States to pick up a higher percentage of funding responsibilities for heritage as a result:

Critical success factors in heritage tourism

Not all heritage places or activities have the potential to be tourist attractions—nor indeed should they be. To become a successful attraction requires taking steps beyond traditional heritage management into the worlds of marketing, business management and the tourism industry itself. It is necessary to deal with a wide range of issues to make heritage tourism work—cultural integrity, identity, site protection, conservation, visitor management, customer service, visitor experience, marketing, economic benefit and benefits to local communities must all be taken into account.

In recent years there has been a considerable amount of research concerning what makes a cultural attraction succeed as a business enterprise. A number of critical success factors have been identified. These factors tend to group into the following areas: [1]

1. Understanding of heritage significance.
2. Effective management of the cultural resource to ensure its key values and integrity are retained.
3. The will to enter the tourism market place.
4. Business planning and management skills.
5. The ability to develop and present distinctive product, to provide an engaging experience for visitors.
6. A focus on customer needs and interests.
7. A well conceived and targeted marketing program which generates local and wider market interest.
8. Community support and ownership.

Even this brief list of factors begins to indicate the complex management required to be successful in heritage tourism. Both heritage and tourism management require a specific focus of expertise. If heritage tourism is to succeed, it must find a way to draw on both sorts of expertise, balancing the needs of both sectors. There is increasing recognition that culture, heritage and communities are the raw materials on which tourism depends—they are what give destinations a distinctive character. Successful heritage tourism must balance the needs of tourism businesses, heritage managers and the community.

Heritage and tourism world views

Heritage organisations are typically concerned with issues of significance, integrity, conservation and sustainability. The primary concern for most cultural organisations is their cultural purpose. They do not see themselves as serving a tourist market principally or at all (Ashworth, 2000: 23). Many are wary of the potential impacts of tourism on cultural or site values and integrity. Yet they are also likely to view tourism as being a way of earning much needed money that can generate funds for conservation works and (sometimes) provide local employment.

Tourist operators, on the other hand, are primarily interested in ensuring that their customers have an interesting and enjoyable visitor experience. They are in business to make a profit. They need to be sure that their product suits the marketplace and that they can meet, if not exceed, their customers' expectations in all aspects of service delivery. Some parts of the tourism industry see that aspects of heritage can become assets to their business operations if they are included in tour packages or developed as tourist attractions. Other operators have no personal interest in heritage or culture and are baffled by suggestions that their customers might be. Many tourism operators view the heritage sector as lacking the business skills and customer focus needed to deliver consistent

service and standards. They find particular difficulties in working with organisations run mainly by volunteers (Arts SA, 1996; Dept of Communications, Information Technology and the Arts, 1999).

Over the last three years, there have been several major Australian initiatives designed to bridge the gap between heritage integrity and conservation requirements on the one hand and the marketplace consumption of tourism on the other. This paper briefly considers some of the key issues and trends in Australian heritage tourism and reviews two new sets of guidelines for responsible heritage tourism, both of which represent collaborative efforts between the tourism and cultural sectors and the communities in which it takes place.

Australian initiatives—bridging the gap

Two major Australian projects have recently produced different tools designed to encourage the growth of heritage and cultural tourism in ways that bring economic benefit while retaining cultural values and heritage significance. They both involve cooperation between sectors—heritage, culture, tourism, business, government and community. Both have gone through lengthy consultation processes which have strengthened the final documents by enabling them to incorporate the views of hundreds of interested individuals and organisations.

1. Successful tourism at heritage places

The Australian Heritage Commission, Tourism Council Australia and CRC for Sustainable Tourism have joined forces to develop these guidelines, published in draft in 1999 and due for publication in final form late in 2000 as *Successful tourism at heritage places.*

Successful tourism at heritage places is

> …designed for tourism operators, heritage managers, communities and others who need to understand the issues involved in tourism and heritage places…A core principle…is the need to look after Australia's heritage assets (Australian Heritage Commission, forthcoming).[2]

Successful tourism at heritage places is identified as requiring 'a commitment to *quality* and *responsibility*, which flows through into business profits and benefits for the heritage place and community where it is located'.

It sets out principles and guidelines for heritage tourism, and includes Australian case studies. The principles it identifies are:

1. Recognise the importance of heritage places. This principle deals with the issue of significance. 'Recognising, describing, understanding and communicating significance is a fundamental part of heritage conservation and responsible tourism at heritage places. Understanding significance makes good business sense for tourism—it is one of the key selling points for products.'
2. Look after heritage places—it is the responsibility of all 'people planning activities at heritage places to take all reasonable steps to avoid impact on the natural and cultural significance of a place'.
3. Develop mutually beneficial partnerships between tourism operators, site managers, other businesses, local communities and Indigenous people.
4. Incorporate heritage issues into business planning.
5. Invest in people and place: Tourism involving heritage places should contribute to both the conservation of heritage assets and to the economic and social well-being of local communities.
6. Market and promote products responsibly—they should recognise and respect significance, respect the wishes of local communities and not create unrealistic or inappropriate visitor expectations.
7. Provide high quality visitor experiences—provide for visitor enjoyment combined with an understanding of place.
8. Respect Indigenous rights and obligations—any tourism activity involving Indigenous people should be discussed and agreed with the relevant community. Cultural protocols and intellectual property rights should be respected.

Guidelines are given for these specific issues:

1. Understanding heritage significance.
2. Forming partnerships.
3. Creating a quality visitor experience.
4. Developing Indigenous tourism.
5. Planning for a sustainable business.

2. Tourism with Integrity

Tourism with Integrity, published at the end of 1999 (DCITA, 1999), was developed through the Department of Communications, Information Technology and the Arts and AusIndustry. This national project was designed to help cultural and heritage organisations work more effectively with the tourism industry. This author led the project team which developed and trialled the model.

It provides a practical framework for cultural and heritage organisations wanting to observe cultural and heritage values and management principles, while building visitor numbers and working successfully with the tourism industry to increase their revenue base. In addition to heritage places, it includes collections, a range of arts activities and event management. It incorporates principles of community consultation and involvement at every level.

The *Tourism with Integrity* model is built around a self-assessment process that can guide organisations in identifying how they are performing on a range of indicators. 'The framework offers a structured way for organisations to identify areas for improvement and to set their own priorities to put processes in place to achieve them' (DCITA, 1999: 1). It is designed to be used on a continuing basis, so that organisations can consciously adopt a commitment to ongoing improvement.

The organisational activities it addresses fall into four areas:

- Planning and information essentials covers business planning and organisation information.
- Specific Focus includes collections management, management of heritage places, interpretation and presentation, community arts and event management.
- Building a customer base covers service standards, meeting customer needs, marketing and working with local communities.
- General management includes natural environment management, legal compliance, financial management, human resources and data, records and information management.

In all, there are twenty categories in the Level 1 model, which is the one most suited to small organisations. It works equally well for organisations run by volunteers, a mixture of paid staff and volunteers or paid staff alone.

The Level 2 model, drawn from the Australian Business Excellence Framework, is more conceptually based and is 'most relevant to larger organisations with a strongly developed management structure' (DCITA, 1999: 81). Pilot projects were run in two States and workshops held around Australia during the 2-year development of the *Tourism with Integrity* models. There was intense interest in the Level 1 model and little in the Level 2 model. The main reasons for this are that the Level 1 model gives a detailed, practical guide that operates in part as a comprehensive checklist. The Level 2 guide is too abstract for organisations unused to thinking conceptually about management. Organisations with the conceptual experience considered that they did not need to use this model.

The trials and workshops also showed that organisations used the model differently from the way the consultants had initially anticipated. The Level 1 categories are set out in fine logical order—beginning with planning (we know who we are, what we do and where we are going) and the essential information that an organisation keeps and disseminates about itself both internally and to the outside world. These seemed to the project team to be the most sensible starting points. However, we found that most people wanted to start with the categories they were most interested in and most comfortable with—so that museum curators for instance, would tend to look first at collections policy and someone in charge of publicity would want to work through marketing and working with local communities.

The framework is robust enough to be approached from any one of the twenty possible starting points, or it can be divided up and different sections of it can be tackled by different parts of the organisation.

For instance, one pilot project was carried out with the Mannum Dock Museum Board, which runs the Mannum visitor information centre, operates the paddle steamer PS *Marion*, is setting up a museum of River Murray history and plans to excavate and restore the Randall dry dock. Here, we set up four different workshops. Each one dealt with a different set of categories, that were grouped to match different sorts of volunteer interests—marketing, boat operations, museum and exhibition planning and administration All the volunteers were invited to come to all the workshops, so that people who were interested in attending any workshop could do so. The end result was a detailed improvement plan that reflected the input of between 30 to 40 volunteers, with a high level of ownership of the recommended actions across all areas of activity.

A different pattern evolved in one of the other pilot projects—with the Burra branch of the National Trust in South Australia. This branch manages the heritage tourism aspects of the town of Burra, including managing the visitor centre, the Burra Passport tour system, a number of heritage sites and four museums. I ran several workshops with branch members, anticipating that each workshop would cover different ground and that we would eventually work through all the Level 1 categories. In fact, different people came to each of the workshops. Most of them wanted to work through the categories that the previous group/s had already worked through, so that is what we did. Ultimately, this meant that around 40 of the Burra National Trust members had worked through about half of the categories, and felt comfortable with the issues that had been identified as being priorities for improvement. Other key areas, like Occupational Health and Safety, which had not been covered in the workshops, were referred to the relevant subcommittees of the Burra branch. I was very happy with this outcome, as it indicated that the Burra National Trust felt sufficiently comfortable with the framework and the process to take it over themselves.

Building ownership of improvement planning and activities within organisations is an important outcome for this process. Paid staff and volunteers from all areas of any organisation need to be involved in discussing issues and developing their own solutions and priorities so that this sense of ownership can be developed. This structured framework provides a neutral vehicle for dealing with what are often high conflict zones within organisations. The very process of going through the self-assessment and priorities setting exercise as a group, builds broad-based ownership of the outcome.

The Burra National Trust is strongly committed to planning as part of its normal business operations. Many organisations are not. Nevertheless, it is suggested that all organisations at least undertake the self-assessment scoring process for Statement 1.1 (p. 21): 'We have a clearly stated vision that reflects our long-term purpose, identity, philosophy and values'. The explanatory notes for this statement add: 'This should identify what is fundamentally important to your organisation'. Working through these questions should make it clear whether tourism will be consistent with the organisation's long-term purpose and values, including heritage significance. If it is not, then appropriate conservation management strategies need to be developed assuming minimum levels of visitation. If tourism *is* an option, then its ramifications need to be

considered carefully. Success in tourism comes only with careful planning, determination and persistance.

Successful Tourism at Heritage Places and *Tourism with Integrity* will be used differently. *Successful Tourism* will be a reference point for principles and general guidelines. *Tourism with Integrity* gives a detailed checklist against which organisations can assess their own performance and work out a structured improvement plan that reflects their own priorities. Each complements the other, and gives further points of reference to relevant codes of practice and accreditation schemes.

Together, they provide a theoretical framework and practical tools that can help heritage and tourism to work together successfully, and with integrity.

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[2] The Australian Heritage Commission has given permission for me to quote from the manuscript of the final draft that is with the printer at the time of writing. I have been a member of the Steering Committee for the *Successful tourism at heritage places* project.

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Blazing the Maine Maritime Heritage Trail: Planning and prospects

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Introduction

The title of this paper suggests a work in progress, and what follows is a nuts-and-bolts description of why and how the Maine Maritime Heritage Trail (MMHT) was brought into being, and what options we see before us.

The Maine Maritime Heritage Trail was developed as an initiative of an organization called OpSail Maine 2000, a working name for MaineSail 2000, Incorporated. The group's immediate brief was to host a tall ships parade in Portland, Maine, in July 2000. From the start of the planning in 1997, the organisers believed that this event should salute the maritime heritage of the whole State of Maine. Its long-term success would be measured by the degree to which it fostered an awareness of the importance of Maine's maritime heritage in the past, and of its relevance today and in the future.

Our first instinct was to try to situate Maine's maritime history at, or at least near, the centre of the public school curriculum. Who could deny the importance of teaching maritime history in a state with a 5 000-mile-long shoreline? Or, in which maritime trades such as fishing, boat building, yachting, passenger shipping under sail and steam are still among the most conspicuous in the State? To name only four highlights of Maine's maritime heritage:

- The Old Town Canoe Company on the Penobscot River makes canoes whose designs derive from Native American originals that antedate the European contact five centuries ago.
- Some of the earliest attempts at European colonization in North America occurred in Maine: Samuel de Champlain of France in 1604, and the English Popham Colony of 1607—the same year as the founding of the Jamestown colony in Virginia. Winter defeated both efforts. Champlain complained 'There are six months of winter in this country.' Today, people say Maine has two seasons, winter and August.
- Maine is one of the few States in the country in which ships and submarines are built and repaired for the US Navy—and not just at one shipyard, but in Bath and Kittery.
- Maine, which is down wind and east of Boston and New York, gave its name to one of the most celebrated sailing ship types ever, the Down Easter.

OpSail Maine 2000 education programme

When MaineSail's education committee began its work, the State had recently completed a study of the public school curriculum, and it was easy to pinpoint exactly how and where Maine's maritime heritage could be taught in the classroom. Yet our discussions with people who had tried to introduce maritime elements directly into schools were sobering.

To give one example, the Maine-based America's Cup syndicate, Young America, worked with a major schoolbook publisher to develop a textbook that used the vessels and history of the America's Cup races as a lens through which to investigate such diverse subjects as physics, meteorology, history and international relations. The book was well written and well received, but it was not a success, in large part because the sponsors overestimated the appeal of maritime themes in general and that of America's Cup races in particular.

At last, the education coordinator at the Maine Maritime Museum told us our top-down approach was doomed. Creating a statewide maritime heritage curriculum might make sense, but it would involve navigating the shoal waters of the State's educational bureaucracy, an undertaking for which we were not at all prepared. But there is a bright side: most museums and historical societies have working relationships with local schools.

These museum-school relationships bring student groups to museums or historical societies to learn about everything from curatorial practice, material culture, and why museums collect certain artefacts and not others, to why they collect anything at all. There are some downsides to relying on such programs to introduce students to the content and meaning of maritime heritage. Not all communities have maritime collections, and some students will not get any exposure to maritime heritage in this way. Even if their community does have a maritime collection, as often as not, it will give students only a fragmentary view of the subject. Seen in the context of a state's total maritime heritage, such community-based orientations pose something of an obstacle, at least from an historian's perspective. One of the things that makes maritime history so interesting is that it is seldom, if ever, a local phenomenon; and the scope of Maine's maritime history is usually regional or international rather than state or local. But smaller institutions are hard-pressed to show the larger picture and to open students' eyes to the wider world of which their maritime communities are very much a part.

Taking all these factors into consideration, it was obvious that if there were any way to create a significant educational legacy for OpSail Maine 2000, it would not be in applying ourselves to a reform of the state school system. Rather, we could do much more for much less by helping individual institutions serve their local schools better. This required two things: giving the institutions

more visibility, and encouraging them to communicate with one another. By giving them greater visibility, we would increase their attraction to educators. Opening lines of communication between different institutions would foster more cooperative and collaborative solutions to common problems. So was born the idea of the Maine Maritime Heritage Trail.

Regardless of how many students they bring through their doors, the fiscal health of most museums in the United States depends on older visitors, especially those with disposable income to spend in shops, on memberships or on direct financial support. In other words, museums like tourists. When it was no more than an idea—in point of fact, when it was barely more than a phrase—the Maine Maritime Heritage Trail won almost immediate acceptance from the maritime heritage community. Museum and historical society directors saw the Trail as a mutually beneficial means of cross-promotion.

The Trail can draw people to individual institutions, but it can also drive them to other sites they might not have known about otherwise. Thanks to the enthusiastic response from these institutions, we got almost instant recognition from the State Office of Tourism, which saw the Trail as a perfect vehicle for its campaign for 'cultural tourism'—luring people to Maine not just to sample seasonal attractions, but also to visit and support year-round institutions of all kinds, including historic properties, museums, and other cultural venues.

In 1998, the Office of Tourism helped launch the Maine Art Museum Trail, whose seven members all have substantial holdings of marine art and are, therefore, *de facto* members of the Maine Maritime Heritage Trail. This past summer, each of these museums hung a show of marine art. This had a three-fold benefit: First, it enabled the museums to capitalize on the publicity garnered by the parade of ships—which drew the largest crowds in the history of Maine. Second, the museums' involvement enabled OpSail Maine to promote the parade of ships and the educational program in areas of the state we might not have reached otherwise. And third, it helped people expand their vision of marine art and of the maritime world as a source of artistic inspiration. It's not just about ship portraits.

Office of Tourism support came as a grant to help finance publication of a Maine Maritime Heritage Trail tourism map. This was a collaborative project involving the participation of about a dozen organizations around the state, both inland and coastal. Once the general form of the map had been agreed upon, the text and supplementary materials were drafted and given to a design team, and the institutional representatives signed off on the finished product. The whole process took about eight months.

The map comprises three distinct elements. First, there is a narrative text sketching the highlights of the maritime tradition. These include geography, maritime museums, historic houses and historical societies, the fisheries, shipbuilding, and naval history. Second, there are tables showing distances along the coast, a schedule of annual events, and a selection of about two dozen notable sites around the state. Finally, there is the map itself. This shows the third of the State where about 90% of the people live. Although there are Trail sites within the area not shown, these are few and far between, as are people and towns.

The Maine Office of Tourism provided direct financial support by paying almost half the cost of developing and printing 50 000 copies of the map. (The total came to about US$20 000.) They also served as a point of distribution to public relations and tourism marketing companies, local chambers of commerce, the Maine Tourism Association, and visitors' centres around the state. In addition, the Trail was written up in *Maine Invites You*, the Office of Tourism travel guide, which is sent out to about a quarter of a million people each year.

The sites listed on the map were chosen by a process of elimination from an inventory of nearly two hundred museums, historic vessels and landmarks, schools, lighthouses, forts and other sites around the state. In terms of diversity, the Maine Maritime Heritage Trail is analogous to South Australia's River Boat Trail—although so far we have not identified a morgue that fits our criteria. Because only twelve percent of the identified sites are listed on the published map, we had to consider how to publicize the other 150 or so institutions.

A printed directory has much to commend it. But at that stage, when we were still uncertain about whether the inventory was complete, it seemed impractical. Also, a plain-vanilla directory without supporting text and illustrations didn't seem worthwhile, and OpSail Maine 2000 certainly didn't have the funds or expertise available to create one.

At the time, we were developing an informational website for the parade of ships—www.maritimetrail.com—and adding a page about the Trail was fairly easy to accomplish. This gave us the flexibility we needed in terms of making corrections and additions to our inventory. We also coded the list so that visitors could find groups of sites according to either their geographical location or the institutions' thematic focus. The grouping by theme, or institutional focus, is very useful for teachers, researchers and the self-directed 'cultural tourist'. Also of great benefit of course is that we could create hyperlinks to websites and email addresses for those institutions with an Internet presence.

Maine Maritime Heritage Trail thematic categories

Archaeological sites	Lighthouses
Archives	Lumbering
Cartographic collections	Marine Art
Children	Museums
Colonial period	Naval
Commerce and trade	Navigation
Environmental organizations	Passenger Service

Exploration
Fisheries
Forts
Historical societies
Historic sites
Islands
Lakes and Rivers
Periodicals
Sail training
Schools
Ship and Boatbuilding
Ships and Boats
Yachting

In addition to the inventory, we also created an events page in which we listed all the lectures, exhibits, openings and other special events going on around the state. If it can be maintained on a regular basis, and effectively promoted to the public, this has great potential to benefit institutions across the state. As it is structured now, however, people have to take the initiative to visit the website to see what is going on. We are currently exploring ways in which we might periodically email reminders or announcements of specific events. Such a mailing list would appeal most to institutions, teachers, travel agents and tour packagers, people responsible for media events listings, and chambers of commerce and similar outlets that can help broadcast this information to the public. This would help keep interest in these organizations alive during Maine's comparatively long off-season.

So far as reaching the general public goes, we know from anecdotal evidence—and personal experience—that electronic media have to be supplemented by printed materials such as a newsletter, printed brochure, or something like the tourism map. From a practical standpoint, no single document will suffice for the entire Maine Maritime Heritage Trail. We should probably consider developing printed matter for a limited number of entities. These could be selected on the basis of the criteria already used in the Internet listing, by either geographical or institutional emphasis, for instance libraries, archives and research institutions, historic vessels, or lighthouses.

We are also considering the possibility of using www.maritimetrail.com to host an information exchange or Internet mailing list. One idea under consideration is to create something along the lines of a Maine Maritime History Information Exchange Group (MaineHist-L, perhaps), a public forum about all aspects of maritime Maine, from people, trades and ships, to events, industries and arts and letters.[1] Such a discussion group would further drive, or direct, people between institutions, whether they are interested in genealogy, shipbuilding, or naval, art, or social history. The discussion group would be tied to the www.maritimetrail.com website, and would help publicize the extant resources and opportunities available in Maine. In time, the ultimate collaborative tool might be a statewide online research directory along the lines of the Pathfinder Subject Guide developed by the Vaughan Evans Research Library at the Australian National Maritime Museum in Sydney.

While websites can be expensive, it should be noted that technology companies are especially eager to offer grants to arts and cultural organizations that are developing ways to reach their markets via the Internet. Moreover, websites don't have to be inordinately expensive: ours cost US$1,150 to develop, but content was generated gratis. It is also possible to use the website to generate funds, either by selling tickets, or by establishing a cooperative on-line store along the lines of www.museumshop.com, which allows shoppers to access museum stores from around the world. (As of December 2000, the only maritime museums affiliated with www.museumshop.com are all in the United States: Mystic Seaport, Peabody-Essex, and the USS *Constitution* Museum.)

Publication

The final component of the OpSail Maine 2000 education programme was the publication of a short maritime history of Maine. Despite a wealth of published material on various aspects of Maine's maritime heritage—the fisheries, the ice trade, the mast trade, shipbuilding, and so on—there were only two books that looked at the state's maritime history in the round. One was more than 50 years old, and the other, though of more recent vintage, was more than 500 pages long, which made it longer and more expensive than we thought appropriate for our audience. So we commissioned *Down East: A Maritime History of Maine*, a 200-page narrative history designed to tell the maritime story of the state, and in so doing to put the work of the institutions that comprise the Maine Maritime Heritage Trail into a broader context. It was written for the kind of broad audience we're trying to appeal to via the trail: students, teachers, tourists and researchers. So far the book seems to have achieved its purpose. It is selling well to the public, and it has been adopted for courses at both the high school and university level. It also seems to be working as a lure for cultural tourists. We received one letter from a reader in Wisconsin who wrote that following his daughter's graduation from college in Maine:

> I thought it unlikely that I would ever return to Maine. (Having driven back and forth more times than I thought humanly possible, I actually didn't want to return.) However, reading [*Down East*] reminded me of places in Maine I wanted to see but never made time for. You've inspired me to return.

Clearly, there is such a thing as a cultural tourist.

Maine Maritime Heritage Trail

The creation of the Maine Maritime Heritage Trail has been something of a top-down process. We have spoken with many institutions, but these conversations have been in the form of one-on-one meetings and not roundtable discussions in which people can bounce ideas off one another. At this juncture, there is still a need for a formal survey of the organizations that comprise the Trail to

Item	**US$**	**AUS$**
Map: 50 000 copies (4-colour, 18" x 24")	21 000.00	40 000.00
Website		
Design	1 500.00	2 850.00
Input and maintenance	gratis	gratis
Hosting fee	250.00	475
Newsletter (bi-monthly)		
Writing/editing	gratis	gratis
Design	N/A	N/A
Production/printing 2 000 copies*	1 000.00	1 900.00
Book: 192 pp. paperback, 5 000 copies		
Author advance	4 500.00	7 605.00
Design, production, printing and binding	11 884.00	23 507.00
Paper stock	N/A	N/A
Total	**$40 136.00**	**$76 360.00**
'Gratis': no one was paid for the service. 'N/A': Expense covered by a third party; amount not recorded. * Per issue.		

Table 1. Maine Maritime Heritage Trail Expenses.

discover which of these ideas will work for the community at large over the long term, and to consider new ideas.

Another weakness in the development of the Trail thus far is that it has also been a largely volunteer effort driven by people working on the periphery of the site-based maritime heritage community. On the one hand, we have the advantage of objectivity and non-partisanship. On the other hand, we have only a vague idea of the realities confronting these institutions. These include seasonal schedules, slender numbers of volunteers, outdated office equipment, and tight budgets.

Conclusion

When we began formulating our concept of the Trail, one overriding concern was to avoid creating a bureaucracy or funding mechanism that would compete for the already scarce resources on which the existing institutions survive. MaineSail, Inc., is not equipped to manage the Trail. At present, it is functioning essentially as a search committee, looking for an institution, or group of institutions, that can work the management of the Trail into its ordinary operations and in so doing represent the best interests of the community at large.

In the long term, it will fall to the institutions that comprise the Trail to fund this themselves, with or without the support of state agencies like the Maine Office of Tourism. However, such a collaborative expenditure by a large group of institutions can foster expanded relationships with schools and help increase revenues from casual visitors and long-term membership. This will strengthen the ability of these institutions to carry out their educational missions, and help make people who live in Maine more aware of their maritime history and of their place in the maritime heritage of the rest of the world.

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New wine in old bottles: Changing public perspectives of maritime heritage in North America and the Pacific Rim

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Figure 1. Mystic Seaport, a privately operated open-air maritime museum in coastal Connecticut. Includes historic replica 19th century maritime village structures, historic sailing vessels, small lighthouse, educational facilities and working shipyard (Photo: R. Kelly).

Figure 2. United States Navy Submarine Service Museum, Groton, Connecticut. Includes small submarines in foreground) and USS *Nautilus*, first atomic powered submarine in background (Photo: R. Kelly).

At this millennium doorstep, it would be useful to measure the changing ways we tell the stories, conduct our studies and educate fellow citizens concerning maritime heritage resources.

Telling the stories of men, women, families and children living aboard vessels long ago (or not so long ago) is much better than only recounting careers of famous ships' captains or looking at nautical antiques as symbols of maritime trade. Because many films, media coverage, books, videos and court decisions dealing with maritime events and heritage are now available to our fellow citizens to a greater degree, we need to match these developments with conservation public education. And, we should emphasize the connections between cultures and nations in peace and war, despite and because of oceans, seas, lakes and rivers.

This very broad topic is divided into three parts:

1. Outreach and Tourism;
2. Protection and Preservation;
3. Research and Recovery.

By citing a few examples in each category from places in North America or the Pacific Rim, the freshness, variety and substance of these activities will be illustrated. There are a great many local and regional venues from which to pick examples—those mentioned here are only a sample.

Outreach and Tourism

At many maritime museums, redesigned public education programs and projects are energetically establishing new historical significance values and contexts for their messages, much broader and inclusive than before. 'Create the desire and decision to visit' within the public is the mantra for successful maritime museums and similar institutions. Broadening the audience, the content, and the opportunities for today's citizens to experience hands-on experiences, maybe sleep-ins, to participate in festival events and as volunteers has become common (see Ashley, 2001).

During the 1999 annual meeting of the Council of American Maritime Museums (CAMM) in San Francisco, several leading speakers stressed 'diversification' for museum mission statements, enhanced volunteerism, innovative teaching of maritime subjects, designing effective outreach programs, or bringing a sailor's day to life with music, role-playing, and interactive exhibits. CAMM is composed of over 60 local, regional, and national museums in Canada and the United States. Its annual meetings are events to 'take the pulse' of the maritime heritage community in the US and Canada.

Sophisticated tourism networks link maritime destinations together such as Mystic Seaport in Connecticut with the nearby US Submarine Service Museum or San Francisco's renown 'Fisherman's' Wharf with the neighbouring National Park Service Maritime

Figure 3. San Francisco Maritime National Historical Park operated by US National Park Service (Photo: R. Kelly).

Figure 4. *Star of India 1863 (*formerly *Euterpe*). Three-masted iron bark operated by San Diego Maritime Museum Association, San Diego, CA (Photo: R.Kelly).

National Historical Park, or San Diego's Maritime Museum with its scenic harbour (Figs 3 & 4). Historic ports of any size are the natural environments for maritime heritage tourism. Since ships and ports do not exist alone they show the modern time traveller that land, sea and humans are inseparable. Some States, such as New Hampshire, Maine or Florida, have developed tourism literature about regional maritime history and shipwrecks. The Museum of Florida's *Maritime Heritage Trail* program includes seven underwater preserves containing shipwrecks dating from 1715 to 1937, illustrated by colourful posters and brochures that encourage responsible diving.

Many maritime heritage organisations have increased young peoples' participation as field trip destinations, youth sailing clubs and so on. Exhibits such as those at San Diego's Maritime Museum show 'Pirates: Drake to Disney' as user-friendly, but message-driven materials, to tell young students of 'real time' people of the past who shaped our present. A night aboard a World War II submarine or a creaking 19th-century 'four-master' teaches more than history textbooks when coupled with songs, performing shipboard tasks and on-board role-playing (Fig. 5).

'Patriotic historical tourism' involves 'the recent past' of national level maritime pride where wartime generations of actors and their direct descendents make personal connections from the past to the present. World War II, Cold War, or continuing ethnic maritime customs are exemplified by USS *Arizona*, *Nautilus*, fund raising campaigns to save warships or specific vessel types of ethnic fishermen (Fig. 6).

Certainly, outreach and maritime tourism are port and starboard of the same vessel—public education!

Marketing of maritime heritage is linked to tourism by the ever-present museum 'gift shop', or party cruises on historic water-craft as fund-raisers, as well as more traditional methods such as entrance fees. Replica vessels such as HMS *Buffalo* (Adelaide), *Amistad* (Mystic Seaport) which touch deep racial issues, or the *Batavia* (Sydney) or *Golden Hinde* (London) re-create the era of exploration for visitors (Fig. 7). Some replicas, such as the HMB

Figure 5. School children viewing forward crews' bunks aboard *Star of India*, San Diego Maritime Museum (Photo: R.Kelly).

Endeavour make touring cruises to modern port cities as funding initiatives and public awareness campaigns. A voyage of colonisation such as the 1620 'Pilgrims' trip from England to New England' was partially re-enacted in June 2001 using *Mayflower* II, a replica Elizabethan era vessel. Several large Polynesian outrigger replicas have made long inter-island voyages, which have invigorated native traditions and added maritime authenticity to cultural tourism in regions of the Pacific.

Finally, some major maritime museums, replica vessels, or agencies managing maritime resources have attractive websites which are educational, marketing and public relations functions rolled together as on-line resources. The growing number of websites is indicative of broad, international attention to maritime heritage resources.

Protection and preservation

In the context of shipwreck protection and preservation, two major legal cases occurred recently in the United States. One suit involved several years of litigation concerning an 1850s side-wheeler *Brother Jonathan* wrecked off northern California (US Supreme Court No. 96-1400, 1998).

Figure 6. USS *Arizona* Memorial with gun turret visible at water level (Photo: T. Mulhern).

A second suit involved two Spanish vessels wrecked off the Virginia coast—the 1750 *La Galga* ('greyhound') and the *Juno* lost in 1802. Although claimed in admiralty court by a salvor, a US Federal judge awarded both wrecks to Spain, in a precedent-making decision. 'Legal salvage' continues to vex many professional maritime archeologists in our part of the world (see Chiang, 1999; Goodheart, 1999). In July 2001, the reknown National Geographic Society published a colourful, detailed global map 'Sunken Treasures: History Swallowed by the Sea' which emphasises 'treasure ships', from antiquity to the 19th century. Research consultants for this widely circulated map included leading professional maritime archeologists from three countries and one well-known salvor.

Regional shipwreck studies and resource inventories are 'bread and butter' issues, as are focussed projects on specific wrecks. Location and identification are the first steps in protection and public interpretation, but how much diver access is often a thorny issue. An excellent divers' guidebook is 'Underwater Wonders of the National Parks', (Lenihan &Brooks, 1998).

Clearly, any project beyond a simple documentation activity usually requires staff coordination and funding shared by involved agency partnerships, involvement of volunteer organizations, and interdisciplinary teams (see Apland & Beasley, 2001; Harrington 2001). Law enforcement is more difficult than on land, but the National Park Service has had a few successful shipwreck looting prosecutions in California and Florida.

Research and recovery

We all utilize various electronic discovery and mapping devices. We gather background historical information, and establish curatorial treatments for submerged artefacts during the course of a project. But what to do with an historic vessel's large timbers after documentation? Ship's timbers from the Basque 1565 galleon *San Juan* or 'Red Bay Wreck', removed from their provenience for study,

Figure 7. *Golden Hinde* replica during a visit to San Francisco (Photo: R. Kelly).

were preserved *in situ* by re-depositing them on the seafloor with a covering for protection. This wreck and its accompanying smaller whaleboats or 'chalupa' are the oldest collection of European-constructed vessels in North America (see Moore, 1998). Parks Canada's Underwater Archeological Services team has done terrific conservation work on these Late Renaissance shipwrecks.

Curatorial and conservation of submerged artefacts, including large ones, has been a challenge and continues to be. Leading the way are modern conservation laboratories in Canada (Centre de Conservation du Quebec, and the Canadian Conservation Institute), a facility operated by the State of Maryland Historical Trust, the Ships of Discovery Museum in Texas where La Salle's *La Belle* materials are preserved, and several others. Better coordination and cooperation between conservators and maritime archeologists is becoming commonplace as technical skills are exchanged.

Finally, maritime shipwreck collections—all too often the salvor's goal—become scattered to different owners. In a San Francisco souvenir shop, one can buy a Spanish coin from the 1622 *Atocha*, legally salvaged by Florida's Mel Fisher. But Saipan Island Government is getting back a collection from the 1638 Spanish galleon *Conçeption* from a Japanese businessman who had purchased half of the materials from a salvor. The people of Saipan are planning a local museum to exhibit these artefacts which have 'come home'.

Conclusion

Do we have new wine or simply new packaging of the old 'ship in a bottle' concept of maritime heritage? New wine requires aging, tasting and then marketing to reach consumers—our fellow citizens—for their enjoyment, education and increased conservation of national historic resources.

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Underwater archaeology and cultural tourism—a mutual benefit proposal for Patagonia

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Figure 1. Location of Patagonia in southern Argentina.

The name Patagonia refers to a very large region that extends throughout the southernmost portion of South America (Fig. 1). To define Patagonia is to define a wild and isolated terrain, which has figured prominently in the fantasies of many travellers and adventurers through the ages. Just for the English-speaking world, names like Cavendish, Drake, Cook, and Darwin represent significant chapters to the legendary tales of Patagonia.

This area is large, almost uninhabited, and represents a third of the total of the Argentine extension, covering more than 800 000 km^2. Despite its vastness, only 4.5% of the Argentine population live in the area.

From a cultural perspective, Patagonia has a long history of human occupation. Since Late Pleistocene and Early Holocene times (between 12 000 and 10 000 years BP) and through the millennia that followed, several nomadic hunter-gatherer peoples lived in different locations from the mild regions of Northern Patagonia to the remote corners of Tierra del Fuego (Borrero, 1995).

Archaeological evidence of these native South American groups include mainly artistic and/or symbolic expressions, lithic and bone technology, and animal remains that were obtained for food.

When the first European explorers and missionaries became in touch with these aboriginal groups, mainly during the 18th and 19th centuries, together with historic accounts and descriptions of the people, a process of cultural change began. Then, during the late 19th century, the native inhabitants of Patagonia were supposed to be an obstacle to the migration policy from the central government of Argentina, which sent the Army to conquer territory by force. When the Aboriginal people were defeated, large waves of immigrants colonised the area. Spanish and English in the far south; Welsh in central Patagonia; and, Swiss and Germans in the northern Patagonia district.

Today Patagonia's ethnic composition has a majority of European descendants. The descendants of native American groups are either mingled among the urban or rural population, or they live in the few Aboriginal reservations that are scattered in different parts of Patagonia.

The main ways of living all over Patagonia are traditionally related to the large '*estancias*' (ranches), or to fishing activities —of course on the coast—or to oil and gas exploitation. Tourism is now growing at a fast rate, and we will soon return to this subject.

From an environmental point of view, Patagonia can be divided into three main areas: the coast; the plateau (basically a steppe in terms of vegetation); and the Andes mountain range.

The vast marine coast stretches along nearly 4 500 km. In the numerous gulfs, bays, inlets and peninsulas along the Argentine shoreline, large colonies of marine animals can be found. Due to the various ocean currents which mix along this coast and thanks to the relatively low traffic and fishing activity, the sea is still rich in plankton, algae, fish and shellfish that in turn serve as food for birds and marine mammal populations.

Figure 2. Number of tourist arrivals per year in Argentina (period 1990–1999).

This area congregates species such as the Southern right whale, various species of dolphin, killer whales, elephant seals, South American fur seals and Southern sea lions, penguins (specially the Magellanic penguin), and various species of cormorants, among many others (see Lichter, 1992; and Narosky & Izurieta, 1993 for species identification).

As regards the Patagonian steppe, it is worth quoting Charles Darwin's impressions:

> In calling up images of the past, I find that the plains of Patagonia frequently cross before my eyes; yet these plains are pronounced by all wretched and useless. They are characterized only by negative possessions; without habitations, without water, without trees, without mountains, they support merely a few dwarf plants. Why, then, and the case is not peculiar to myself, have these arid wastes taken so firm possession of my memory? (Darwin, 1989 [1839]: 374).

This desert of a peculiar beauty once used to be the lush home of a great diversity of extinct animals represented by fabulous paleontological remains. Today, the bushy steppe hosts animals such as the flightless lesser rhea, the Patagonian hare, and one of the wild South American camelids, the guanaco, which can also be found in the grasslands of the Andes. These mountains offer one of the most spectacular landscapes in the Western Hemisphere, and for this reason a chain of National Parks protect their natural beauty. Numerous lakes fed by glacial run-off reflect the majesty of the snow-capped peaks, and the mountain sides are covered by primeval forest.

What about tourism in Patagonia? During the last decade the tourist activity has increased a lot in Argentina (Fig. 2) and today it represents one of the most important sources of income in the Patagonian region.

The international traveller who arrives in Patagonia is usually an experienced one who has already seen most of the world's main tourist attractions. This visitor is curious about the myth of Patagonia, its pristine and unspoiled environment and landscapes, as well as its *estancias* and the history of the *estancieros* (ranch owners or managers), who lead a hard life. In most of the cases, and despite the fact that the prices are higher than those of other destinations all over the world, the spell of the region and the concept of the 'End of the World' is stronger. The travel literature and the testimonies of writers such as Darwin (1989 [1839]), Theroux (1979) or Chatwin (1977), to mention but a few, motivate the visitors a lot.

Patagonia is known as a tourist destination as a whole. Its highlights are: Valdes Peninsula—specially for whale-watching—the glaciers and lakes on the Andean range, and the southernmost city in the world, Ushuaia, in Tierra del Fuego.

In all these places the traveller can find well-developed infrastructure and services; varied range of hotels; scheduled tours featuring the most interesting attractions, all of them with multilingual qualified guides; good roads and communications; good standard of services; and various major domestic airlines that serve and connect these destinations.

A case study: Puerto Deseado

This is the name of a town and harbour on the northern shore of the Deseado estuary (more specifically, a *ría* — cf. Perillo, 1996) as it meets the South Atlantic Ocean (Fig. 1). It is located 2 000 km south of Buenos Aires in the province of Santa Cruz, and its population is of some 10 000 inhabitants.

Puerto Deseado is mostly dedicated to fishing and harbour-related activities, which experienced a significant growth in the last twenty years. This generated a demographic increase, and attracted immigrants from different parts of the country.

The rural sector is not much developed. The economy of Patagonia traditionally relied on sheep breeding; therefore huge properties were established by the end of the 19th century to produce wool and ship it to Europe as a prime export. These last years, due to the fall of the international wool prices and changes in consumer trends, the *estancias* as well as the towns directly related to the wool production are switching to tourism as their main source of income.

What are the natural and cultural resources of Puerto Deseado?

What first comes to one's mind is the estuary. With a large intertidal coastal zone, Puerto Deseado is one of the places in Patagonia—and possibly in Argentina—with greatest biodiversity (Elkin, *et al.*, 2000).

Among the typical species that can be seen in the estuary there is the Commerson dolphin (*Cephalorhynchus commersonii*)—one of the smallest dolphins in the world and endemic of the Magellanic region; three species of cormorants: the King cormorant (*Phalacrocorax albiventer*), the Blue-eyed cormorant (*Phalacrocorax atriceps*) and the Rock cormorant (*Phalacrocorax magellanicus*); and two species of penguins, the Magellanic penguin (*Spheniscus magellanicus*) and the rockhopper penguin (*Eudyptes chrysocome*).

Land mammals such as guanacos (*Lama guanicoe*) and Patagonian hares (*Dolichotis patagonum*), as well as rheas

Figure 3. Number of tourist arrivals in Puerto Deseado per season (period 1996–1999).

(*Pterocnemia pennata*), can be seen in the steppes surrounding the town of Puerto Deseado.

The area also has a particular geomorphology, with creeks, caves and rockshelters that are not so common in other places of coastal Patagonia.

As regards its cultural resources, the region of Santa Cruz Province where Puerto Deseado is located has been inhabited by native hunter-gatherer groups since the early Holocene (Borrero, 1995) and there are several archaeological prehistoric sites such as the ones already mentioned for Patagonia in general.

Also, the history of naval exploration and land colonization of Puerto Deseado left traces in the form of interesting documentary material, as well as archaeological remains. Among the latter, there is one particular site which is unique: a very well-preserved historic shipwreck, the HMS *Swift*. The ship was a British sloop of war which sank in Puerto Deseado in 1770 during an exploration voyage off Port Egmont, the English military base in the Malvinas/Falkland Islands (Gower, 1804).

Since the discovery of the wreck in 1982 the Mario Brozoski Regional Provincial Museum holds the general coordination of the *Swift* Project and hosts the collection of all artefacts recovered from the site. In 1997 the Museum requested the scientific-technical assistance of the underwater archaeology team of the National Institute of Anthropology, and field-work began in 1998.

Because of the relatively non-traumatic sinking process (the ship had been stranded on a rock until it sank at low tide), the soft sediment of the estuary bottom, the significant degree of burial of the site, and the cold water temperature, the state of preservation of both structural remains and artefacts is remarkable.

Tourism in Puerto Deseado and HMS *Swift* as a touristic resource

The number of visitors in Puerto Deseado has been increasing in recent years (Fig. 3), in accordance with the general trend already mentioned for Argentina. However, the tourism industry in Puerto Deseado is very little developed and much less significant than in other Patagonian locations.

Limitations in the system of transportation and access to the place is perhaps the main reason to explain this situation. By road the closest city, Comodoro Rivadadavia, is at 320 km and, besides, Puerto Deseado is out of the way of the main national road. By aeroplane there are very limited services with no direct connection with Buenos Aires, and as a tourist there is no way to get to Puerto Deseado by ship. Visitors, then, surely choose other destinations in the region, which in turn constantly offer better and better tourist services, while Puerto Deseado continues without having a strong reason to improve its own resources.

At present Puerto Deseado has two three-star hotels and some smaller lodges and inns. Travel agencies do not formally exist and services are rendered by local outfitters who dedicate to navigation in the estuary and some soft hikes in the area.

As for the tourism which visits Puerto Deseado, 95% are Argentine travellers and only 5% are tourists from other countries, in all cases the average stay being two days. The principal means of transportation used by visitors is car (82%), and very few people arrive by bus or plane (14% and 1% respectively) (Puerto Deseado Secretary of Tourism, 1998).

The way people know about Puerto Deseado is mainly through information centres, recommendation by family and friends, and guide books. And finally, the reason why tourists visit Puerto Deseado is for its natural attractions, and usually as part of a larger itinerary (Puerto Deseado Secretary of Tourism, 1998).

Within this context, the case of the HMS *Swift* deserves special attention, since as we said it is a unique cultural resource (there is no other place in Argentina with such a well-preserved historic shipwreck), and also because many places in the world have shown how attractive for tourism a shipwreck can be.

In the first place, and considering that the wreck was discovered nearly twenty years ago, the fact that it is not mentioned in the travel literature on Patagonia is a very clear symptom of the little significance assigned to this cultural item. Of a sample of 8 travel guides of Argentina, both local and international, 7 of them mention Puerto Deseado and its natural resources, but none of them mentions the *Swift*—nor the museum where the artefacts are kept (Table 1).

The question is why is this the case, if, as we said, usually the remains of an historic shipwreck are attractive to public of all ages. The answer for the HMS *Swift* case is not simple. Among the main reasons that we find for it to be so under-valued are the following ones, which in many cases are interrelated (Fig. 4).

Since the discovery of the wreck, there has been a lack of funds for an adequate research and conservation programme. Consequently there is a poor museum presentation which in turn cannot improve because of insufficient infrastructure, funds, and human resources.

After two decades of such a situation, the museum personnel (just one person as permanent staff) is discouraged and have lost enthusiasm.

TOURIST GUIDE	COMMENTS	MENTIONS P. DESEADO	MENTIONS MARINE WILDLIFE	MENTIONS THE *SWIFT*
Le Guide Du Routard – Chili / Argentine (1999–2000 edition)	International (French)	X	X	–
Guide Autrement – Patagonie (1996 edition)	International (French)	X	X	–
Insight Guides (1996 edition)	International (English)	X	X	–
Lonely Planet (1995 edition)	International (English)	X	X	–
Adventure Handbook of Southern South America (1992 edition)	International (English and Spanish)	–	–	–
Guia Turistica YPF (1995 edition)	Local (Spanish)	X	X	–
Guia Pirelli (1995 edition)	Local (Spanish)	X	X	–
Guia de Las Regiones Turisticas Argentinas (1995 edition)	Local (Spanish)	X	X	–

Table 1. Inclusion of Puerto Deseado and the *Swift* site in international and national tourist guides.

For the provincial and national authorities the *Swift* project is not a high priority; it is not included in the mid-term planning (2–3 years), which always leaves it outside the political agenda. It is worth adding that in Argentina in general, there is a lack of middle and long-term policies in terms of cultural resource management (Endere, 2000).

The *Swift* site is also a 'hidden resource', as opposed to the highly visible natural resources of Puerto Deseado. The latter, also, are probably considered abundant and varied enough for the current tourist demands. Moreover, there is a general belief that underwater archaeology is so expensive that it can never be afforded by South American countries.

The harbour and fishing industry also plays a role against the *Swift* project, which can be seen as a threat—or at least an obstacle—for what is the main economic resource in Puerto Deseado. A very clear symptom of such a situation is that, even though the *Swift* wreck has been declared an historical heritage site, it was not even considered in the environmental impact studies performed in relation to the harbour development. In turn, this reflects the weakness of legislation that is supposed to protect the cultural heritage.

Finally, a particular phenomenon that must also influence this lack of valorization of the *Swift* site is that in Patagonia in general anything British is negatively regarded especially after the war that took place between Argentina and Great Britain in 1982 for the sovereignity rights over the Malvinas/Falkland Islands.

The scenario, then, becomes the vicious circle shown in Figure 4, which tends to paralyse the *Swift* project and which prevents the wreck to be presented to the public in an attractive manner. However, we believe that there is a great potential for the *Swift* as a tourist resource, since it is an archaeological site which has the advantage of excellent preservation conditions plus a great amount, and diversity, of materials; in addition, over 70 interviews by different mass media in relation to the *Swift* project already reflect a significant interest of the public in the topic.

Another favourable situation for a potential tourist development related to this site is that there is an ongoing research project, which provides a significant 'added value' for visitors, as well as long-term feedback and dynamism to any potential public archaeology initiative such as museum displays.

A tourism developmental proposal for Puerto Deseado including marine archaeology

On the basis of what was reviewed so far, we believe that tourism development in Puerto Deseado, or in any comparable location in Argentina or abroad, should take into account the following proposals (Elkin, *et al.*, 2000):

- Create a general Interpretation Centre of the region integrating the natural and cultural heritage;
- Relate the general Interpretation Centre to more specific touristic attractions, such as the Brozoski Museum;
- Compensate the low visibility of certain resources by means of a good interpretation;
- Encourage the active participation of local communities in the decision-making process and in

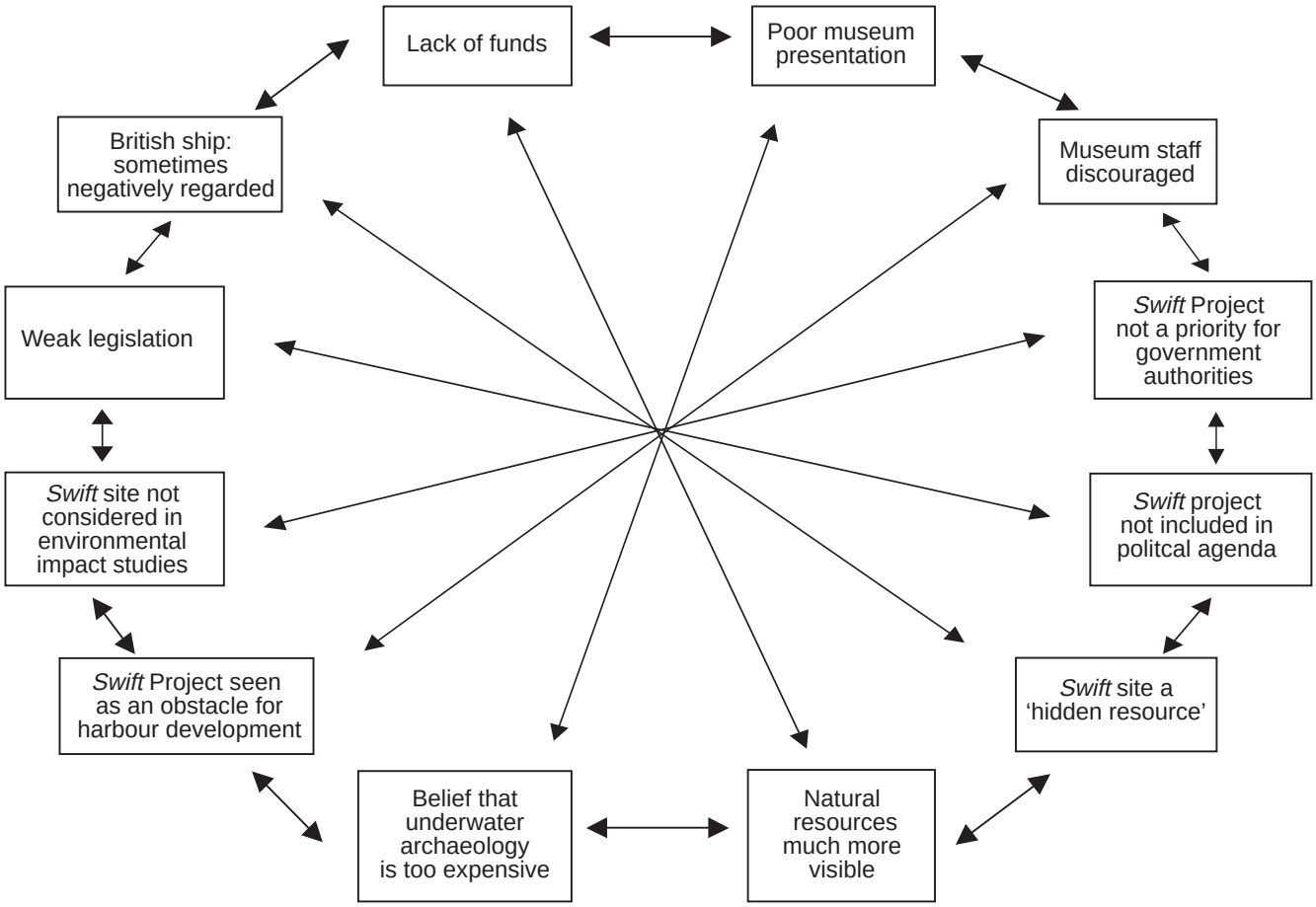

Figure 4. Relationship between different negative aspects related to the HMS *Swift* Project.

the economic aspects of a touristic development project;
- Optimize the local human, institutional, logistical and physical resources which are already available in the region;
- Develop programmes to train volunteers and paid workers from the local communities to work in the projects;
- Develop mutual cooperation agreements between national and foreign or international institutions;
- Develop cooperation agreements between the private sector and government agencies;
- Coordinate tourist programs which put visitors and researchers in contact;
- Organize scientific workshops and courses;
- Organize study trips at different levels;
- Produce publications for the general public and to specialized public;
- Produce updated information on cultural and natural heritage for tourist guides;
- Produce updated information on cultural and natural heritage for the mass media;
- Contact potential sponsors related with tourist facilities and merchandising;
- Encourage the development of a tourist infrastructure that reflects a respect and valorization of the cultural and natural heritage (e.g. architecture);
- Develop merchandising and other representative products of the region or topic considered, stimulating small-scale industries;
- Develop complementary recreational proposals (rental of recreational equipment, organization of photographic safaris, trekking and hiking trails, etc.);
- Contact foreign travel agencies (e.g. through e-commerce) in order to promote the incorporation of this region as a tourist destination with special characteristics.

Summing up, we agree with current worldwide trends in heritage management which consider the natural and cultural resources as mutually related (e.g. Australian Heritage Comission, 1990; UNESCO, 1972, 1994). Therefore, the *Swift* site—as well as other cultural resources of Puerto Deseado—should be integrated as much as possible with the natural resources of the area. The fact that the latter are the greatest attraction should be seen as an advantage instead of an obstacle by those of us who want to increase the valorization of cultural heritage.

The creation of a Natural and Cultural Interpretation Centre is proposed for Puerto Deseado as a place which can offer general information to the visitor on the cultural and natural heritage of the region in an interrelated manner (Elkin, *et al.*, 2000). Geology, prehispanic archaeology, naval history, religious missions, rural settlements, or traditional and industrial fishing could be some of the topics included, and they can be associated to other tourist attractions such as more specific museums, hiking trails or heritage landmarks referred to different topics that can also be interrelated.

For instance, in the case of the *Swift* or any underwater archaeological site, there is an obvious connection with the marine environment. Moreover, since at present Puerto Deseado does not have any tourist facility in relation to the marine ecosystem, the museum where the *Swift* materials are kept could become a place dedicated to the cultural and natural heritage of the Deseado estuary.

Within such an approach, the *Swift* site and its contents can be presented to the public as a dynamic cultural and natural system. For instance, the action of currents, biofouling, and harbour pollution over the archaeological remains are not only central agents in site formation processes, but they are also part of the general ecosystem of the estuary, ultimately even related to the Commerson's dolphin.

The same integrated approach between culture and nature can be applied to the relationship between navigation in general and oceanography; another example can be the connection between the geomorphology of the Puerto Deseado area with the fact that the *Swift* survivors lived in caves and rockshelters until they were rescued a month after the accident.

In general terms, Puerto Deseado seems to offer a great potential for tourism development based on natural and cultural resources. Proposals or guidelines like the one outlined in this paper can contribute:

- To create means for the development of a qualified type of tourism;
- To offer different options to people with different interests;
- To favour, directly or indirectly, new job opportunities and new economic circuits, such as the merchandising related to the regions and topics under study;
- To provide specific educational means and tools, usually including a direct contact with the cultural and natural environment;
- To encourage the recovery of local traditions; and
- To develop a greater valorization of the natural and cultural heritage at all levels.

However, prior to any project of this sort, there is a need of research for a tourist carrying capacity assessment.

As for the adoption of management models which are being successfully applied in other countries, they can be considered as possible general guidelines to follow, but it should be kept in mind that the concept of 'good' or 'proper management' is not universal but varies according to different situations and contexts (Elkin, *et al.*, 2000). Eventually, each region, country or community finds its own path in the relationship with its cultural and natural heritage.

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Underwater heritage: The case of Argentina

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Introduction

Argentina has traditionally forgotten about its underwater cultural heritage, in spite of being a country with some 5 000 km of coastline, having a significant proportion of its land under fresh water and a rich maritime and naval history.

The explanation may be due to several factors. With very few Argentinean archaeologists experienced in scuba diving, and with still so much to do on land, underwater archaeology may be considered a low priority. Ignorance of the potential magnitude of Argentinean underwater cultural heritage, combined with the general belief that underwater archaeology is so expensive that it is only possible in 'First World' countries, may exacerbate such situation (Elkin, 1998, 1999).

Consequently, the underwater cultural heritage was not generally considered explicitly in official or private policies regarding cultural heritage research and conservation. This situation prevailed not only in Argentina but also in most countries within the region. For example, in southern South America, the underwater cultural heritage was not only unprotected in many ways, but the activities of treasure hunters were even encouraged by many sectors. Countries like Uruguay and Brazil have already lost a great deal of their historical heritage (Sotheby's, 1993; Rambelli, 2000).

In this regard, the scarcity of sunken vessels that transported precious metals has been an advantage for Argentina, reducing the targets for treasure hunters. If the case were different and we had attractive sites for commercial exploitation, such sites would be vulnerable because there is neither effective legal protection for historic shipwrecks nor public awareness of heritage matters in general; and, in the context of the local political and economic situation, caring for old ships is far from being a priority.

Fortunately, things are changing now. There is an increasing concern about the underwater cultural heritage at many different levels and sectors, such as academics, scientists, political authorities, governmental and non-governmental organisations, school children and teachers, travel agencies, and even private companies which have no intention at all of keeping, buying or selling archaeological goods. And while at a national level the law is still ineffective for protecting the underwater cultural heritage, several people and institutions are working hard to improve things. On the other hand, in countries where such heritage is in a vulnerable position, international organisations can contribute by exerting political pressure on the local authorities until effective protection of the heritage is achieved. In this regard, the power of mass media and the high speed of today's communications can become valuable allies.

In the following sections, we review the (slow) process that led to the present-day situation of the Argentinean underwater cultural heritage which, as stated before, is gradually being recognised as a new and exceptional reservoir of archaeological information requiring scientific study, better legal protection and adequate management.

First initiatives concerning the Argentinean underwater cultural heritage

It is worth stating from the very beginning that, we conceive archaeology as a discipline carried out with scientific standards and by professional archaeologists. Therefore, many underwater activities relating to submerged archaeological remains must not necessarily be considered as archaeology. In spite of the fact that sometimes these activities deserve credit for their concern and care about underwater cultural remains, they usually lack a scientific systematic approach, especially regarding theoretical and methodological issues (Dellino, 2000a; Elkin, 1998).

A detailed review of the process that gradually led to the origin of underwater archaeology in Argentina has been done elsewhere (Elkin, 1998). A brief summary is presented in the following paragraphs.

In 1978, archaeologist Jorge Fernandez supervised a group of scuba divers that raised an historic log boat from Lake Nahuel Huapi, in the Patagonian Andes (Fernandez, 1978, 1998). This event is significant in the sense that it represents the first occasion where an archaeologist became interested in submerged archaeological remains. Nevertheless, unlike some authors (cf. García Cano, 1997a: 396; Fernandez, 1998: 1), we do not consider it to be the first example of underwater archaeology in Argentina due to the lack of scientific method and standards.

The early 1980s represent a period where a more systematic approach to archaeology in Argentina occurred. In 1980, a report prepared by the Argentinean committee of the International Council of Monuments and Sites (ICOMOS), on the basis of a UNESCO initiative started a decade earlier, noted the lack of specialists and the potential of underwater archaeology in the region (Pernaut, 1998).

Figure 1. Porcelain tableware from HMS *Swift*. (Scale: 10 cm.)

Between 1983 and 1985, the Argentinean committee of ICOMOS and the World Heritage organised three seminars on underwater archaeology. However, the organisers, lecturers and participants of these events, as well as the institutions where they were held, were almost exclusively related to the architectural community with the addition of scuba divers. The only exception from the archaeological field was Dr Jorge Fernandez, lecturer in the last seminar (Libonatti, 1986; Pernaut, 1998).

The outcome of these seminars was the creation of the ICOMOS–Argentina Underwater Archaeology Working Group (later called Underwater Heritage Working Group). Coordinated by architect Javier García Cano, it was composed of architects, experienced divers, and later a museum curator (Libonatti, 1986).

The last years of the 1980s, therefore, were characterised by the action of this ICOMOS–Argentina group. Its main tasks were experimenting with underwater archaeological techniques in several locations, acquiring bibliography and performing educational activities mostly for scuba divers (Ansaldo & García Cano, 1986; Pernaut, 1998).

Among the underwater activities carried out by the ICOMOS group at that time, the most relevant one was the survey of the HMS *Swift* wreck in Puerto Deseado (Port Desire), Santa Cruz province. The *Swift* was a British sloop of war which sank in 1770 while exploring the South Atlantic off the Patagonian coast, and we will refer to this site again in the next section. The activities of the ICOMOS–Argentina group at the *Swift* wreck site basically consisted of the mapping of structural remains and their work, carried out over four field seasons, is described in their respective interim reports (GTPS–ICOMOS, 1987, 1988, 1989, 1992), as well as in a general publication (Murray, 1993).

During the 1990s, the ICOMOS underwater heritage group gradually disbanded and, since then, has not been very active. Instead, several underwater activities have been carried out by a non-profit private organisation called the *Albenga Foundation for the Preservation of Underwater Cultural Heritage*, created in 1991 (Bonel, 1998).

Albenga's first underwater project in Argentina took place in 1994. It consisted of a new survey and the production of a documentary film of the *Swift* wreck (García Cano, 1997b). Shortly thereafter, the Albenga

Figure 2. Blue and white porcelain plate from HMS *Swift*.

Foundation employed archaeologist Mónica Valentini and began to participate in several underwater surveys and excavations, most of them in connection with the Department of Anthropology of the University of Rosario (Santa Fé Province). Their joint work is described below.

Argentinean underwater heritage: The current situation

A diversity of actions related to the underwater cultural heritage—including research, management, and financing—currently performed by many agents in Argentina is commented within this section. In many cases their activities are closely interrelated.

The National Institute of Anthropology Programme

As stated earlier, in the last few years Argentinean archaeologists have started to become more aware of the relevance of the country's underwater cultural heritage (Elkin & Dellino, 1998; Elkin, *et al.*, 1994; Olivera, *et al.,* 1995). The creation, in 1995, of the programme 'Investigation and Conservation of the Argentinean Underwater Cultural Heritage' at the National Institute of Anthropology (hereafter INA), belonging to the National Secretary of Culture, is a clear example of the change in attitude of professional archaeology towards Argentinean underwater heritage.

Since its creation, the main goals of this programme were:

(a) to organise an interdisciplinary team;
(b) to compile bibliography referring to underwater cultural heritage;
(c) to promote the development of legislation to protect and preserve the underwater cultural heritage;
(d) to inform the general public about the relevance of the underwater heritage and the urgent necessity to carry out scientific and professional research;
(e) to create a national database regarding underwater cultural remains;
(f) to train the members of the team and volunteers in the application of archaeological underwater techniques;
(g) to implement archaeological research; and
(h) to incorporate the specialty of underwater archaeology within the academic community.

Today, half a decade later, considerable progress has been made regarding all the original goals (Elkin, 2000b):

(a) the team is formed by several archaeologists–divers, plus specialists in conservation, legislation, naval architecture and scuba diving;
(b) the library—which is open to the public—has some 600 titles;
(c) the Institute has been providing technical advice for the Argentinean parliament and is representing the Argentinean Government for the development of the Convention for the Protection of the Underwater Cultural Heritage fostered by UNESCO;
(d) dozens of conferences, lectures, and short courses have taken place in different spheres including schools, scuba diving clubs, and the Argentinean Coast Guard;
(e) over 500 shipwrecks have been already incorporated into a national register of underwater cultural remains;
(f) the team and volunteers constantly increase their training in the application of archaeological underwater techniques with specialists from countries with more experience in underwater archaeology;
(g) for three years now, the INA team has been carrying out archaeological research; and
(h) the professional connection of one of us (Elkin) with two universities has stimulated their interest in underwater archaeology.

Even though every goal of the INA programme is important, and all of them are interrelated (for instance, developing legislation is useless if there is no public awareness of the underwater heritage), we would like to stress our achievements as regards two of them: doing archaeological research; and, contributing to the development of underwater archaeology in the academic sector.

Archaeology underwater: the HMS Swift *Project*

As previously stated, the sloop of war HMS *Swift* sank in 1770 in Puerto Deseado (Santa Cruz Province) in southern Argentina. The wreck remained totally unknown for over two centuries, until it was found in 1982 by a group of local divers. After its discovery, the site was declared of historical interest and was incorporated into the provincial cultural heritage. By then, random removal of dozens of artefacts was occurring and they were stored at the Mario Brozoski Museum of Puerto Deseado.

In 1986, the local municipality contacted the ICOMOS–Argentina Underwater Heritage Working Group (GTPS) asking for advice on tasks such as survey, rescue and conservation. At that time, there were no underwater archaeologists in Argentina and the activities carried out by the GTPS–ICOMOS group were done to the best of their ability, but without scientific and archaeological standards.

The conservation of the remains recovered was done within the same museum but there were no specialists academically trained in conservation of marine objects. Hence, basic terrestrial conservation criteria were used.

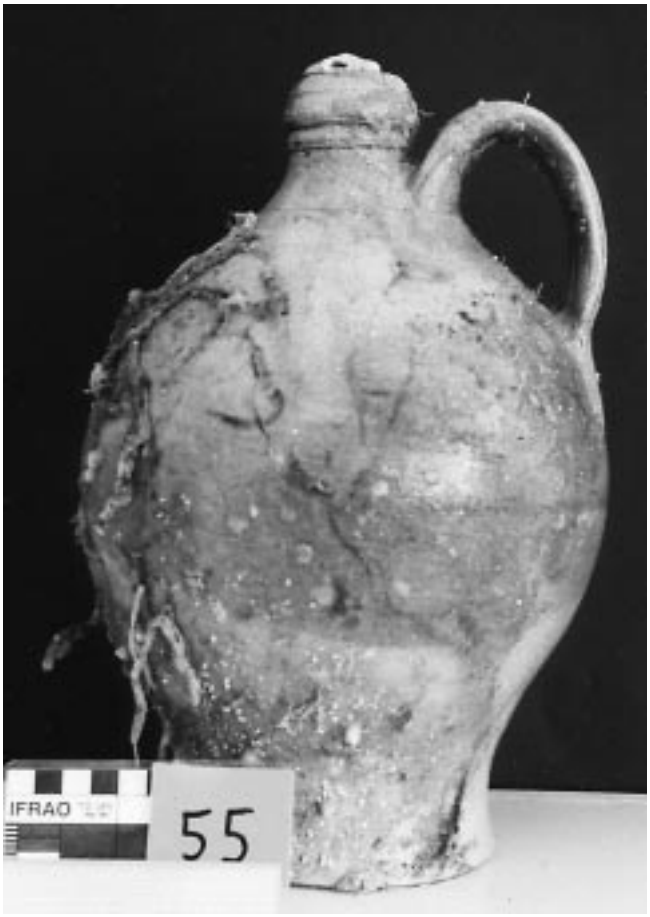

Figure 3. Stoneware jug from HMS *Swift*. (Scale: 10 cm.)

In 1997, the provincial authorities of Santa Cruz requested scientific–technical assistance from the INA underwater archaeology team through the director of the Brozoski Museum and general coordinator of the *Swift* Project, Maria Isabel Sanguinetti. On the basis of an institutional agreement, and within the programme 'Investigation and Conservation of the Argentinean Underwater Cultural Heritage' (referred to above), a new stage of work on the *Swift* Project began. Its most relevant characteristic is the presence of professional archaeologists in the research team. These people, who are also scuba divers, direct and develop the archaeological research within the framework of an interdisciplinary approach including specialists in areas such as museum conservation, naval architecture, marine biology and professional diving.

At the *Swift* site some 300 artefacts have been registered—besides hull remains, which are also being recorded. The main typological and functional categories include artillery (cannons, swivels, cannon balls and musket balls); tableware and kitchen utensils (plates, bowls, cups, glasses, spoons, different kind of bottles and flasks); and also clothing, furniture and personal objects. The archaeological record formed by structures and

Figure 4. English-made earthenware teapot and lid from HMS *Swift*.

Figure 5. Glasses from HMS *Swift*. (Scale: 10 cm.)

artefacts provide important information about ship construction and various aspects of life on board a British military vessel during the 18th century (Elkin, *et al.,* 1999; Elkin, *et al.,* 2000). The action of several natural agents concerning site formation processes is also being evaluated (Elkin, 2000a; Bastida, *et al.*, 2001).

Between 1998 and 2000, the National Secretary of Culture provided the main financial support to the *Swift* Project. At present, this source of funding has been completely cut off due to a general reduction in the budget of most governmental institutions, combined with a change of government authorities at all levels.

Currently, the *Swift* Project is mainly financed by the Antorchas Foundation (which supports arts and science all over the country). Occasional funds have also been received from the British Embassy in Argentina as well as from private companies. However, in general terms, the project is suffering from a lack of adequate financial support affecting field-work seasons and conservation facilities, to the detriment of its development and continuity (Dellino, 2000a; Dellino & Endere, 2001).

Finally, the Brozoski Museum in Puerto Deseado, operating as the conservation laboratory for the project, lacks the space and other resources to preserve, store and display the material recovered from the *Swift* in a proper way.

Underwater archaeology at the University of Buenos Aires and the National University of the Central Province of Buenos Aires

At the University of Buenos Aires, by far the largest one in the country, a proposal was presented in 1998 by the Department of Anthropology to offer a semester-long course on underwater archaeology, at least as an optional subject for archaeology undergraduate students. One of the authors (Elkin) was in charge of the course and it became another landmark in the growth of underwater archaeology in the country. Several participants are already preparing their graduation theses on topics such as underwater site formation processes in relation to wooden materials, cultural resource management applied to shipwrecks, and pre-Columbian coastal settlements. Other students, though undecided about research topics, are already learning and training in scuba diving and underwater archaeological techniques. Because of the success of this course, it is probable that it may be taught again in the near future.

In addition, within the University of Buenos Aires, members of the INA team are working on doctoral research projects related to underwater archaeology. One is combining historical documents and underwater archaeological evidence in the South Atlantic (Dellino, 1999, 2000a&b), and another is surveying several historic shipwrecks along the Patagonian coast (Argüeso, 2000).

The National University of the Central Province of Buenos Aires is connected to the INA programme as well. In this University, where the career of archaeology was created only a decade ago, there are already two undergraduate research theses related to underwater cultural heritage: one concerning a database of shipwrecks in the Tierra del Fuego/Staten Island area (Magallanes, 1999), and the other on corrosion experimental studies relating to submerged metals (Piñeyro, 2001).

In summary, the INA programme is now connected to several other institutions providing an extremely valuable cooperation in the preservation of the Argentinean underwater cultural heritage.

Albenga Foundation and the National University of Rosario

Outside the governmental sphere, the most active organisation concerned with the underwater cultural heritage is the previously mentioned Albenga Foundation, formed by a group of private companies providing financial support for underwater archaeology and other matters relating to the underwater heritage. Since its origins in 1990, the Albenga Foundation has been involved in many underwater surveys and excavations in several countries (Bonel, 1998).

In Argentina, Albenga has been working on joint projects with the Department of Archaeology of the National University of Rosario (Province of Santa Fe) since 1995. Their main research is focussed on the study of the 16th-century riverside city of *Santa Fe La Vieja*, a joint project with the Institute of American Art of the School of Architecture, Design and Urbanism of the University of Buenos Aires and the Ethnographic Museum

of Santa Fe. The main goals of the underwater work at this site are to determine the processes related to the river dynamics; to develop an archaeological methodology adapted to the very particular conditions of the site, and to train people in that specialty (García Cano & Valentini, 1996, 1999).

Another project in which the underwater tasks are carried out by the Albenga Foundation in connection with the University of Rosario is the project directed by archaeologist A.M. Rochietti in the Lower Paraná river basin (Province of Santa Fe). In this area, the partly submerged material remains of a 17th-century Aboriginal settlement called San Bartolomé de los Chaná form a 1 ha site in which European and native ceramic sherds are the most abundant finds (Rochietti, 1997, 1998; Rochietti & Grandis, 1995–1996, 2000). Rochietti proposes a model of an island site in which the main variables considered are its size, setting and the type of spatial distribution of materials. She states that whenever a section of a site is submerged, underwater archaeology becomes an unavoidable interpretive tool (Rochietti, 1997).

Another underwater work in charge of the Albenga Foundation began in 1996 at the lagoon coastal site of Las Encadenadas—province of Buenos Aires, in the frame of an archaeological project sponsored by CONICET and directed by archaeologist Antonio Austral since 1985 in relation to several sites dated between *c.* 2 000 to 3 300 years BP. At Las Encadenadas, the goal was to obtain a more complete archaeological record by evaluating the magnitude and depositional characteristics of material which lay underwater. The survey revealed that in all cases the archaeological material (mostly lithic and ceramic remains) was found in a good state of preservation and without any fouling. Different lines of evidence lead them to conclude that post-depositional natural processes were the main factors that caused the presence of underwater remains (Austral & García Cano, 1997, 1998).

Concluding remarks

It is very difficult, but not impossible, to carry out underwater archaeological scientific projects in South American countries. The serious economic recession that the region is facing certainly affects the possibilities of increasing the financial support obtained mainly from governmental institutions. However, the examples mentioned in this paper provide a good basis for future actions regarding this field of study.

In the academic sector, in the last few years Argentinean archaeologists have started to become aware of the importance of systematically studying and protecting the underwater cultural heritage. The activities that are being developed in relation to underwater archaeology, at least at three Argentinean universities, reveal an increasing interest in the field.

Comparing the present situation with a few years ago, it is obvious that significant progress has been made regarding underwater archaeology in Argentina. From our point of view, the most relevant achievement is that archaeologists are becoming well trained in scuba diving and in underwater archaeological techniques. However, the general tendency in archaeology is to work with an interdisciplinary approach, which must be specially underlined in scientific projects dealing with underwater cultural heritage.

Important progress has been achieved among the non-academic community as well. There has been an increasing awareness of the importance and potential of Argentinean underwater heritage. For example, the cooperation provided by institutions which are directly related to the water environment like diving associations, the Argentinean Coast Guard, and the Navy, represents an invaluable benefit for our underwater cultural heritage. This shows how the lack of funds for archaeological research can be compensated by logistical support, human resources and diving equipment provided by such sources. Moreover, their participation in the field-work seasons of the *Swift* Project has been extremely valuable.

As for the situation in other countries in the region, at least in Brazil, Uruguay and Chile there are local archaeologists making significant efforts to develop the specialty of underwater archaeology, to create a public consciousness of the importance of the submerged heritage, and to fight against the sometimes overwhelming activities of treasure hunters (Martínez, 1995; Carabias, 2000; Rambelli, 1998, 2000).

The main obstacle that South American countries in general seem to be facing in the development of underwater archaeology is in relation to their weakened economies that prevent them from having even the minimum resources needed. Nevertheless, the hope may lie in joint efforts such as the examples previously mentioned for Argentina, but on a larger scale. It could be an excellent means for preventing the destruction of cultural remains lying within the jurisdictional waters of individual States if the protection and research of the underwater cultural heritage becomes a real international responsibility. Some recent legislation initiatives, such as the Convention for the Protection of the Underwater Cultural Heritage ratified by UNESCO, are very much along that line, but other types of international efforts are needed. For instance, archaeological projects performed jointly by countries of common cultural or historical interests can provide mutual benefits. In particular, shipwrecks constitute ideal agents for approaches like the one suggested because of their relation with various geographical areas along the navigation and trading routes.

To sum up, though there is still a long way to go, Argentina as well as other South American countries, are already on a good path. Underwater heritage provides an enormous potential for study in the years to come, and the promotion of better legislation, greater public awareness and more financial support will help to achieve this aim.

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Archaeology, management and potential cultural tourism in Andean Argentina (South America): The case of Quebrada de Humahuaca

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Figure 1. The rift valley Quebrada de Humahuaca, Central South Andes.

Introduction

Argentina is a country with a rich natural and cultural heritage over many different regions, which should be managed for its protection, and to promote cultural tourism. Furthermore, Argentina also faces many problems: a lack of awareness about the importance and the potential of this heritage, mainly by the political leaders, but also by the people; and, a lack of policies and programs to manage this heritage.

This paper presents a proposal for a specific case, the rift valley of Quebrada de Humahuaca, located in the Central South Andes (Fig. 1), which concentrates a long history of human occupation covering more than 10 000 years, showing a close and changing relationship between human societies and a specific environment, which is impressive in terms of its natural beauty.

This history of human occupation including the present day relationship between human societies and this particular environment can be described as a 'continuing cultural landscape' according with the UNESCO classification. It offers a unique opportunity to be managed in a way that would allow its preservation along with the development of cultural tourism programs sustainable for present populations.

This paper presents an assessment of the potential of Quebrada de Humahuaca—whether it should be considered as 'continuing cultural landscape'; and, its potential to be managed in an integrated way.

To do this, several items are taken into account and analysed, such as geomorphological, geographical, environmental, archaeological, historical and anthropological aspects of the region. This is then taken together with an evaluation of different concepts to be used in the process.

Concepts, definitions and methodology

The concept of 'heritage', and specifically of 'cultural heritage', has developed considerably over the last few decades, not only in meaning but also in depth and extent. This was noticed by UNESCO, an institution devoted to the promotion and protection of the international heritage. In 1994 it produced a document with a renewed methodology and concepts to evaluate the world heritage, as well as the UNESCO world heritage natural and cultural lists.

This document carries out an evaluation of all the studies concerning these matters over the last ten years and arrives at the definition of concepts and a common methodological procedure as a result of a detailed analysis of the different approaches adopted.

The evaluation concluded that, from its inception, the World Heritage List had been based on an almost exclusively 'monumental' concept of the cultural heritage, ignoring the fact that not only scientific knowledge but also intellectual attitudes had developed considerably in the past twenty years, towards the extent of the notion of cultural heritage, together with the perception and understanding of the history of human societies.

Since then, neither art history, architecture, archaeology, anthropology nor ethnology any longer concentrated on single monuments in isolation but rather considered cultural groupings that were complex and multidimensional, and which demonstrated, in spatial terms, the social structures, ways of life, beliefs, systems of knowledge and representations of different past and present cultures in the entire world.

A number of gaps and imbalances were also discernible on the World Heritage List. For example Europe was over-represented in relation to the rest of the world; historic towns and religious buildings were over-represented in relation to other types of property;

Figure 2. View of the bottom of the Quebrada de Humahuaca, Central South Andes.

Christianity was over-represented in relation to other religions and beliefs; historical periods were over-represented in relation to prehistory; 20th-century, 'elitist' architecture was over-represented in relation to vernacular architecture; and, finally, all living cultures, and 'traditional' ones, as well as their diverse relationships with their environment, figured very little on the List.

This impoverishment of the cultural expression of human societies was also due to an over-simplified division between cultural and natural properties. This took no account of the fact that in most human societies landscape, which featured or was created or inhabited by human beings, was representative and an expression of the lives of the people who lived in it. So, in this sense, it was equally meaningful culturally.

The document also considered it necessary to take into account new concepts of the idea of cultural heritage and to increase the number of types, regions and periods of cultural property that were under-represented. It proposed to move away from a purely architectural view of cultural heritage of humanity towards one which was much more anthropological, multi-functional, and universal. World Heritage should thus consider the products of culture by means of several new thematic approaches: modes of occupation of land and space, including nomadism and migration, industrial technology, subsistence strategies, water management, routes for people and goods, traditional settlements and their environments, and so on, thus giving much more importance to the three-dimensional time–culture–human achievement grid.

Under this perspective both the theme of *human coexistence with the land* and *cultural landscapes* as defined in the 1972 Convention acquire new dimensions and importance.

Cultural landscapes have been defined as representative of the 'combined works of nature and of man', illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal. They should be selected on the basis of their representativeness in terms of a clearly defined geo-cultural region and also for their capacity to illustrate the essential and distinct cultural elements of such regions.

Different cultural landscapes could reflect specific techniques of sustainable land-use, considering the characteristics and limits of the natural environment where they are established, and on a specific spiritual relation to nature.

Protection of cultural landscapes can contribute to modern techniques of sustainable land-use and at the same time can maintain or enhance natural values in the landscape. The continued existence of traditional forms of land-use supports biological diversity in many regions of the world. The protection of traditional cultural landscapes is therefore helpful in maintaining biological diversity.

The term 'cultural landscape' embraces a diversity of manifestations of interaction between humankind and their natural environment and fall into three main categories, namely:

i. *landscape designed and created intentionally by man:* such as garden and parkland landscapes constructed for aesthetic reasons which are often (but not always) associated with religious or other monumental buildings and ensembles.
ii. *organically evolved landscape*: results from an initial social, economic, administrative, and/or religious imperative and has developed its present form by association with and in response to its natural environment. Such landscapes reflect that process of evolution in their form and component features.

They fall into two sub-categories:

- *a relict (or fossil) landscape* is one in which an evolutionary process came to an end at some time in the past, either abruptly or over a period. Its significant distinguishing features are, however, still visible in material form.
- *a continuing landscape* is one which retains an active social role in contemporary society closely associated with the traditional way of life, and in which the evolutionary process is still in progress. At the same time it exhibits significant material evidence of its evolution over time.

iii. *associative cultural landscape*: powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent.

Adopting a comprehensive approach to the concept of Cultural Heritage and considering the importance given in this paper to the human society—natural setting relationship, the most suitable definition is that given by Pearson and Sullivan (1999) who consider that:

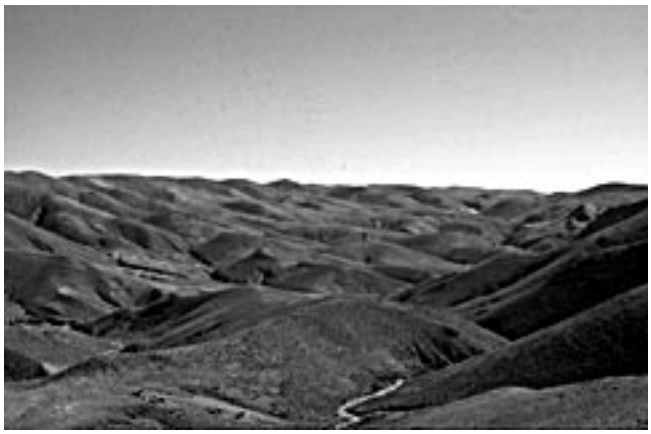

Figure 3. View of the high part of the rift valley system.

Figure 4. View of the present landscape: local and exotic animals (camelids and goats) and plants (cactus and trees together.

> Cultural resources are the results of humanity's interaction with or intervention in the natural world or its natural resources. In the broader sense 'cultural resources' includes all the manifestation of humanity… (Pearson & Sullivan, 1999: 4).

Moreover, cultural heritage includes all the manifestation of humanity, past or present, material and non-material, that can have archaeological, historical, ethnographic, scientific, social, symbolic or artistic relevance or be significant for a specific human group (Pearson & Sullivan, 1999: 4).

The significance of the cultural heritage is the most important topic to be considered. The significance or 'value' of a specific cultural heritage or a heritage place 'can be initially defined as the capacity or potential of the place to demonstrate or symbolize or contribute to our understanding of or appreciation of the human story' (Pearson & Sullivan, 1999: 7).

Taking all this into account, this paper will concentrate on an evaluation of the Quebrada de Humahuaca as an *organically evolved continuing cultural landscape* based on the analysis of the natural setting, the cultural development which has occurred since the first human population arrived there, the different kinds of relations between society and environment over time, and the present situation. Finally, this paper will consider the different values of these 'cultural resources', for the local people, the national community and for the international interest, considering their particularities and differences that could potentially be a special attraction for the development of cultural or scientific tourism.

The case study: Quebrada de Humahuaca

According to the criteria and the definitions presented above, this case study can be defined as a *continuing cultural landscape* because:

- there are visible combined works of nature and of mankind;
- these works are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal;
- these works are representative of a clearly defined geo-cultural region;
- they are illustrative of the essential and distinct cultural elements of this region;
- they reflect specific techniques of sustainable land use and their variation through time, within a traditional pattern of economic system;
- they reflect the specific spiritual relation to nature that the past and present population have had through time until present days, showing a deep cultural continuum;
- this continuing cultural landscape has developed its present form by association with and in response to its natural environment;
- it reflects that process of evolution in their form and component features and results from an initial social, economic, administrative, and/or religious imperative;
- it retains an active social role in contemporary society closely associated with the traditional way of life;
- the evolutionary process is still in progress;
- it exhibits significant material evidence of its evolution over time; and
- it represents the totality of the cultural landscape and includes the whole range of natural and cultural values represented within the landscape.

The *significance* of this cultural landscape can be defined as aesthetic, artistic, scientific (geological, geographical, archaeological, historical, ethnological and sociological), symbolic and social by different human groups whether local communities, scientific community, visitors or tourist with different interests.

Figure 5. Archaeological sites with deposits of oldest human occupation.

3.1 Natural heritage

The Quebrada de Humahuaca is a long and big rift valley located in the southern portion of the Central Andes (Fig.2). Politically, it belongs to the Argentine Republic, within the Province of Jujuy and runs through the Departments districts of Humahuaca, Tilcara and Tumbaya, close to the border between Argentina and Bolivia in Southern South America.

Geologically it is located within the Eastern Range (Cordillera Oriental), a long mountain range which extends from Bolivia south to Argentina and constitutes the eastern limit of the Andes. The Eastern Range is the border between the highlands, to the north and west, with the lowlands to the east were the tropical jungle begins. So, the Quebrada de Humahuaca constitutes a limit between very different environments.

The geomorphologic characteristics of the Quebrada de Humahuaca begins with a Palaeozoic basin which was elevated during the Miocene, Pliocene and Pleistocene orogenic movements, bringing an elevated entity which maintains its basin nature through which a whole hydrographic system runs.

The extension of the rift valley is 166 km. All the basin occupies 725 km^2. The rift valley system begins in the high plateau to the west and in the high peaks to the east, at an average altitude of 5 000 m above sea level (a.s.l.) and ends at 1 500 m a.s.l. where the rift system goes into a different environment related with the lowlands and its jungle vegetation. The general shape of the rift valley system is a tree with the main trunk located in a North–South axis through which the main river flows southward.

Different geological events are still occurring, related with the typical dynamics of the rift valleys: massive erosion, re-deposition, catastrophic flood events, orogenic elevation in course, etc. These events, together with the high visibility of the past geological process are exposed on the rocks and slopes surfaces, affording a unique opportunity to study and visualize the geological history of the region.

The environment is arid with a 300 mm annual rainfall, but with good water resources at the bottom of the basin. Climate includes the 'mountain subtropical' on the bottom of the basin and the 'high plateau arid' at the top of the rift valley system (see Buitrago & Larran, 1994). The conditions change according with altitude and exposure to winds. The flora includes a great variety of steppe species (such as *Baccharis boliviensis, Adesmia tucumanensis, Prosopis ferox*) and the very characteristic cactus (*Trichocereus pasacana* and *Opuntia)* (see Ruthzas & Movia, 1975). The fauna belongs to the 'Andean Domain' which has a great variety of species like big rodents (*Lagidium viscacia* and *Chinchilla brevicaudata)* and other small animals like *Chaetophractus vellerosus*; the carnivores are foxes (*Dusycium culpacus*) and pumas (*Felis concolor*); the herbivores are the most important for human economy, the wild species are guanaco (*Lama guanicoe)* and vicuna (*Vicugna vicugna),* for the last 3 000 years there have been also domesticated ones, specifically lamas (*Lama glama).* Until recent times, a species of deer was common in the region (*Hippocamelus antisensis).* In the higher altitudes there are condors (*Vultur gryphus*) and among the species with economic value to human population the most important are ostriches (*Pterocnemia pennata*) and tinamou (*Rhynchotus rufescens*). The more common reptiles are little lizards (*Liolaemus*) and different species of snakes (*Bothrops).*

EVOLUTION OF THE LANDSCAPE

This description corresponds to the present environmental conditions, though this region has changed through time.

The climate has suffered changes during the last 10 000 years, since the human population first occupied and developed in the region. At the initial moments, consistent with the boundary between Pleistocene and Holocene, these highlands started to be free of glacial and peri-glacial environment, becoming more suitable for human colonization. At the beginning of the Holocene (Early Holocene) the climate was much colder and more

humid than today. During the Middle Holocene occurred a very arid episode called 'Hipsitermal' which produced dramatic changes in the environment; the Late Holocene presents less humid condition than the Early Holocene but more humid than the Middle Holocene. These variations in temperature and humidity affected the human populations in their development, not only the first hunter-gatherer groups but also the farmers and herders who developed in the following millennia.

In present times, in spite of the general stable geomorphologic features, the bottom of the basin is highly unstable due to the very intense erosion and re-deposition processes. These processes erase and create huge features of the landscape, sometimes destroying terraces and other features, and other conforming new cones of great alluvial deposits. Consequently, the characteristics of the landscape and the topographical resources for human settlement and movement changed constantly. This situation determines that this region is considered to be of high geological risk.

3.2 Cultural heritage

Within this natural environment the human population arrived, lived and changed through more than 10 000 years, showing always a particular form of relationship with the landscape, which can be traced through time, maintaining a basic traditional way of life.

The Quebrada de Humahuaca was the setting for a continuous process of local human development which was just one case of the general development of human kind, closely related with the historic process occurring on a global scale, with some particularities.

The first human population of the region is only one instance of the process that was occurring at global scale, when the end of Pleistocene and the beginning of Holocene allowed human groups to occupy land that, until then, was covered by ice or with a peri-glacial environment. The process involved exploration, colonization and effective occupation of this 'new land' which at that moment, due to the characteristic of the resources allowed a hunter gatherer way of live.

During the Middle Holocene, a drastic reduction of the humidity and increase in aridity resulted in an abandonment or occasional occupation of the territory.

At the beginning of the Late Holocene the human population returned to occupy these territories, but now in a different way, starting a new process in the relation with the environment. This situation was related to the population increase at a supra regional level which produced a saturation of available land. This made it impossible to maintain a hunter gatherer way of life and pushed the human groups towards the adoption of new forms of relationship with the environment. In so doing, the following millennia showed a process of plant and animal domestication and profound changes in the structure of the human societies themselves, at social, political and ideological levels.

This process, occurring also at a global scale, had specific characteristics and, due to the local conditions of natural resources, the human density and the supra regional development, created conditions under which the human societies never reached the complexity of central areas like Peru or Mexico. In this case the human societies reached a situation of initial concentration of power, the beginning of social inequality and intensification of food production when an expansive military empire, coming from Central Andes, dominated them.

The Inca empire conquest of the region, marked an important and particular historic event in the region, occurring at the same time in the entire South American highlands.

Shortly after that, another process took place that was occurring at a planetary level: the encounter between two worlds—the invasion of European expansive empires over the Americas. The Spanish conquerors came and assimilated this territory, giving a drastic end to the local and isolated process developed during more than 10 000 years, and integrating it thereafter into the general world history.

The following development also adopted local characteristics of the general process occurring in the rest of the world. The last centuries witnessed the wars of independence and the birth of the present National States. The process goes on and, at the moment, the region keeps its traditional way of life adapted to the present historical conditions.

To study and describe this process of local human development, considering the great amount of information provided by archaeological and historical research in recent publications we suggest (Hernández Llosas, 1998, 2000) using temporal analytical units that could reflect the process, avoiding the interpretation that traditional archaeology uses, in the known time–space frameworks. These units or 'time blocks' are arbitrary divisions of the archaeological time continuum, according with the radiocarbon dating which cluster around specific dates together with the consideration of dramatic changes or events observed in the archaeological and historical record, such as transition to productive economy, the Inca conquest or the Spanish invasion and colonial times. These blocks can be subdivided into 'segments' when the process requires it. Table 1 shows the proposed scheme and the correlation with other proposals in use for the same region.

Block 1 (*c.* 11000–5000 BP.) corresponds to the Pleistocene–Holocene edge and to Early Holocene, when the first archaeological evidence of human occupation of the region appears, which is one of the earliest for the Country. The known archaeological sites are caves and rock shelters located in the upper part of the rift valley system. These sites show intense domestic occupation as temporary summer camp sites of hunter gatherer groups;

Time Blocks	**Characteristics**	**Other proposals**
Block 1 *c.* 11000 – 5000 BP *c.* 9050 – 3050 BC	First human occupation of the region, hunter-gatherer economy.	Early Preceramic
Block 2 *c.* 5000 – 3000 BP *c.* 3050 – 1050 BC	Human societies with transitional economies from hunter-gatherer economies to food production.	Late Preceramic or Archaic
Block 3 *c.* 3000 – 1000 BP 1050 BC – AD 1050 ***Segment 1*** *c.* 3000 – 2000 BP ***Segment 2*** *c.* 2000 – 1500 BP ***Segment 3*** *c.* 1500 – 1000 BP	Human societies with productive economies. Hunting and gathering persist with less economic importance. New technology: ceramics. Early transition, first herders' communities. Intensification of herding; first territorial conflicts. First concentration of population in small towns.	Formative or Early and Middle Agricultural – pottery Periods
Block 4 *c.* 1000 – 550 BP AD 1050 – AD 1450	Intensification of agricultural production and herding practices. More concentrated towns, bigger and fortified. Pottery technology and metallurgy with better quality. Beginning of consolidation of social differentiation.	Regional Developments or Late Agricultural – pottery
Block 5 *c.* 550 – 450 BP AD 1480 – AD 1535	Inca conquest, redistribution of the settlements, the population and the economy according with imperial interest.	Inca conquest
Block 6 *c.* 450 – 150 BP AD 1535 – AD 1800 ***Segment 1*** *c.* 450 – 350 BP ***Segment 2*** *c.* 350 – 150 BP	Spanish invasion. Aboriginal resistance, final defeat, conquest. Colony.	Spanish – Aboriginal Contact Colony
Block 7 *c.* 150 BP – present AD 1800 – ***Segment 1*** *c.* 150 – 100 BP ***Segment 2*** *c.* 100 BP – present	Modern National States. Independence wars. Conformation of the National State. Modern European immigration and recent social and political process.	Republican Period

Table 1. Proposed 'time block' scheme and correlation with other proposals in use for the rift valley of Quebrada de Humahuaca.

the most common activities represented are processing and consume of wild fauna, mainly wild camelids (guanaco and vicuna), the artefacts are stone and bone tools related with hunting practice and leather treatment. Two sites had mortuary deposits, and others have rock paintings of abstracts motifs. Until now there are no evidence of bigger or complementary sites, and is assumed that this is caused by the intense process of erosion described, which 'erase' the archaeological evidence located in the bottom of the rift system.

Towards the end of this block (*c.* 7500–5000 BP) and in coincidence with the Middle Holocene with a dramatic climatic change which provoked a high increase of the arid conditions, the archaeological record shows a 'silence' which can be interpreted as an abandon or very little use and mobility within this region.

Block 2 (*c.* 5000–3000 BP) corresponds to the beginning of Late Holocene, when the humidity conditions increased. The archaeological record of this block shows a re-population of the region, the evidence comes from caves and rock shelters located in the upper part of the rift valley system, where brief domestic episodes of occupation are found; a few sites among them show other kinds of

deposits, like special ritual offerings and human burial associated with very rich assemblages of artefacts. During this time, human societies were undergoing a change in their economies, from hunter gatherer way of life to food production, denoted by the appearance of the first evidence of domesticated plants (Fernández Distel, 1974) and animals (see Yacobaccio, 1997). This change in the economic systems appears together with different patterns of site and land use: the appearance of funerary contexts showing symbolic or social differentiation and the ritual use of hallucinogenic substances (cebil) suggests that a completely different process was taking place, as the hunter-gatherer way of life was ending and more complex ways of ideological, social and economic organization were starting, and would develop during the next millennia.

Block 3 (*c.* 3000–1000 BP) corresponds to the consolidation of the food production economies, characterized by mixed practices of agriculture—herding and hunting/gathering at a regional level. During this block important differences can be observed which allow subdivision into minor segments:

Segment 1 (*c.* 3000–2000 BP) corresponds to the initial development of this process, which started in the previous Block, but during this time the archaeological record shows dramatic changes in the subsistence practices together with the first appearance of new technologies, such as pottery. The sites are located also in the upper part of the rift valley system and show evidences of short and temporary camp sites with domestic activities of food consumption cooked with pottery. In one site a complex human burial was found showing variation in the mortuary practices and the presence of pottery and grinding artefacts as mortuary offerings with high symbolic function. In a few sites, several rock art paintings were found showing a completely different pattern to the previous times; now the human figure dominates the selected theme and appears in groups (Aschero, 1979). All the evidence suggests that different human groups where inhabiting the region, moving from the bottom to the upper part of the rift valley system according with an economy of agriculture–herding–hunting, with the initial process of social differentiation developing but with few inter group tensions and conflict.

Segment 2 (*c.* 2000–1500 BP) corresponds to the consolidation of the productive economic practices and shows some variation regarding the previous segment. The sites were found not only in the upper part of the rift valley system but also on the bottom: the first are associated with special herding activities; and the second are related to permanent residential bases devoted to agricultural activities. The sites located in the upper part show a profusion of rock art production which depict vivid scenes of groups of anthropomorphic figures fighting with other groups, and closely associated with groups of lamas and herding activities. All the evidence suggests a dramatic change in the pattern of land use and the beginning of inter group conflict due to fights to set the rights on herding territories.

Segment 3 (*c.* 1500–1000 BP) corresponds to the expansion of the economic systems developed during the previous segment. The archaeological record shows sites in the upper part of the rift valley system, in caves and rock shelters with less intensity of occupation than the previous period but an increase in the number of settlements located in the bottom of the rift valley system, adopting a more complex structure of semi conglomerates of hamlets associated with more developed agricultural facilities (Hernández Llosas, 2000). This evidence shows a tendency to a more intense use of the lower parts of the landscape for agricultural practices and the slow concentration of the population in these parts.

Block 4 (*c.* 1000–550 BP) corresponds to the intensification of the practices of food production and the expansion of the settlement system, characterized by the appearance of big conglomerated villages, and the production of more sophisticated technologies in ceramics and metallurgy. These changes suggest that completely different social and political structures were developing during this time, with much more social inequality and the conformation of organized polities.

Block 5 (*c.* 550–450 BP) corresponds to the Inca conquest of the region together with the whole South Central Andean area. This conquest resulted in the assimilation of the local polities into the Inca Empire at the military, economic and political levels and the archaeological record shows this situation in the structures of the sites, the features of the buildings and the material culture brought or produced locally with Inca characteristics.

Block 6 (*c.* 450–150 BP) corresponds to the Spanish invasion, the aboriginal resistance, the final defeat of the aboriginal people and the establishment of the Spanish colonial system. The complexity of this process and the occurrence of many events in such a short time in archaeological perspective allows the subdivision of this block into two segments:

Segment 1 (*c.* 450–350 BP) corresponds to the first encounter between Spanish conquerors and the aboriginal population. The changes that this situation provoked in the aboriginal way of life and the reaction of these people resulted in the resistance war, the final defeat of the aboriginal people and the establishment of the conquest conditions. Toward AD 1600, when the Spanish colonial system was operating in the region, the local development which took 10 000 years of distinctive process ended.

Segment 2 (*c.* 350–150 BP) corresponds to the beginning and the development of the Colonial system, the dramatic changes that this situation imposed on the way of life of the local population and the integration of

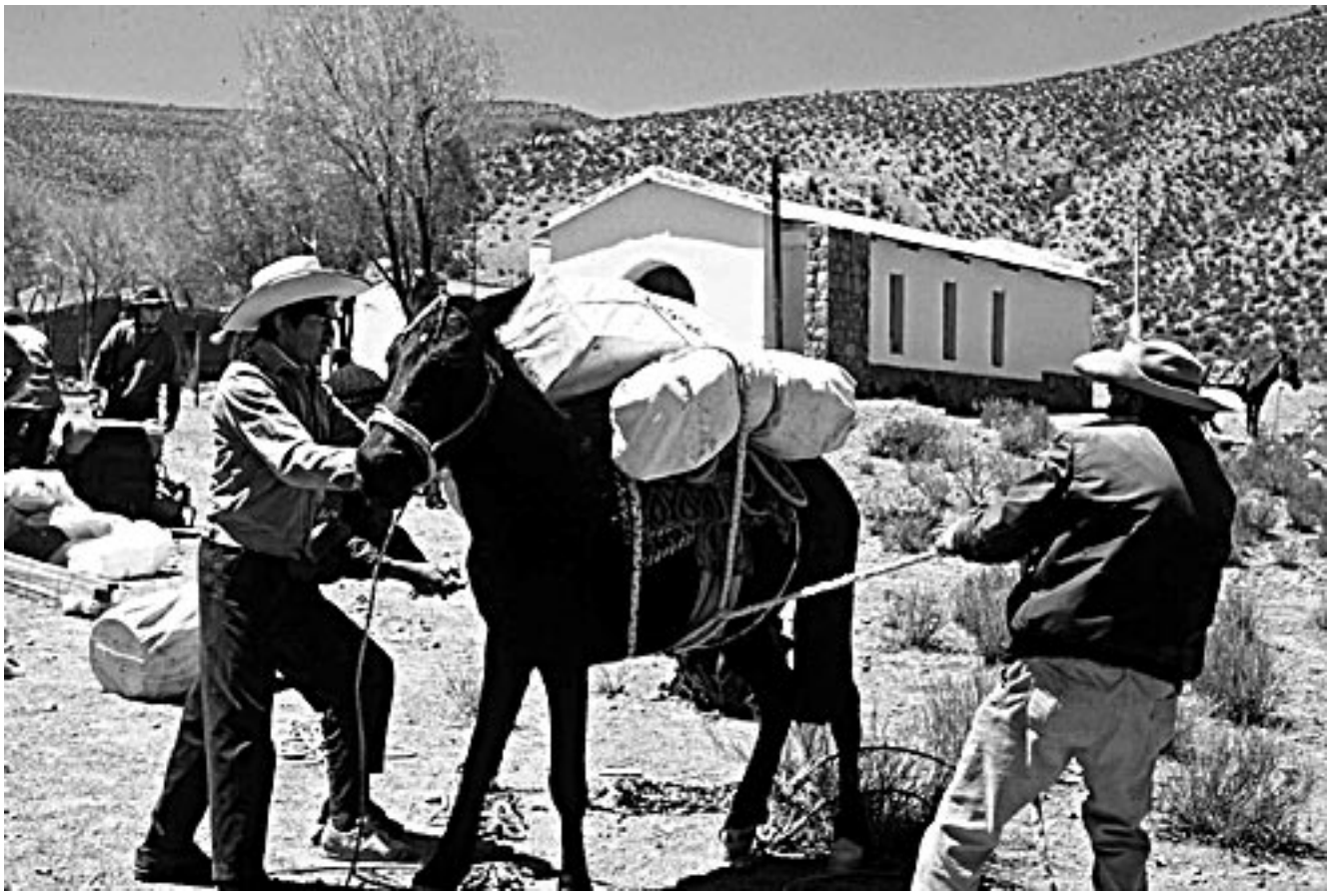

Figure 6. Colonial church and present population with historic traditions.

the history of this region with the general process that was taking place in the rest of the world.

Block 7 (*c.* 150 BP–present) corresponds to the independence war against Spain, the conformation of the National State and the modern European immigration and the recent social and political process. This block also allows subdivision, even in a such short period of time.

Segment 1 (*c.* 150–100 BP) corresponds to the historical process which ended in the independence war against Spain and the consequent conformation of the National State, followed by the civil war and the final national organization. All this historical process had an important representation in the region under study, and played a crucial role in the whole situation.

Segment 2 (*c.* 100 BP–present) corresponds to the more recent historical events related with the global process, which resulted in an important modern European immigration to this land and the occurrence of complex recent social and political process which shaped the present situation of this region.

Throughout the whole process, and in spite of the dramatic changes produced by the assimilation of this region with global history from the time of the Spanish conquest, the people and their relation with the land managed to maintain a traditional way of life in which practices that started from the beginning of the human presence in the region may be observed. These practices are related not only with economic activities but also with ideological, symbolic and religious practices. This situation provides the linkage for uniting the past with the present, and to recognize the singularity and personality of this specific spot on the Planet Earth.

4. What can this region offer through its cultural and natural heritage for tourism

According to the description given above, the Quebrada de Humahuaca is considered as a special place with important cultural and natural heritage, defined as a *Continuing Cultural Landscape*, that has multiple 'significance' or 'values' (in terms of Pearson & Sullivan, 1999).

This significance is the regional concentration of many manifestations of humanity, past and present, material and non-material, that have archaeological, historical, ethnographic, scientific, social, symbolic and artistic relevance for different human groups, and which possess the capacity to demonstrate and contribute to our understanding and appreciation of the human story (Pearson & Sullivan, 1999).

The different human groups that 'value' this heritage are not only the local community, who consider it as the

manifestation of their own culture and their homeland but also the national community that consider this place as special because of its natural beauty and singularity, and because of its historical significance. The region also has the potential to be an interesting place to visit and experience for international visitors, considering its particularities and differences.

Taking multiple significance into account and the groups of interest, this heritage can be developed as an important destination for 'cultural tourism'.

But, what is cultural tourism all about? There are many possible answers, but one important one could be the interest of different groups of people to visit different places and to learn something about the place while visiting it.

The different groups of interest can be people coming from remote countries who want to know places and situations completely different from their own, people coming from the same country but from different realities who wish to know this specific place, or people coming from the same place who wish to know more about their place.

This heritage can be experienced at different levels. The most immediate one is to admire its natural beauty, to visit the present towns and interact with the local people. A deeper experience could be to visit some archaeological and historical sites as well as museums, few of which are open to the public at the moment. A much richer experience could be to access the 'information' given by the scientific studies, presented in a mass communication format and to access other types of information, such as the meaning the local people give to their cultural landscape.

So, the quality of the experience for any of those groups of interest will be related to the capacity to show and to communicate the local natural and cultural heritage in a way that the visitors could have a more intense or deep experience of the place.

What is the potential of the Quebrada de Humahuaca to develop this? To answer this question it is necessary first, to undertake an evaluation of the characteristics, visibility and present state of preservation of the natural heritage, and the material and non-material cultural heritage; and, second, an evaluation of the present conditions in general terms, its constraints and opportunities.

Assessment of the heritge

Natural Heritage

- Highly visible geological features, very illustrative of the geological history.
- Presence of geological formations with a high degree aesthetic value.
- Particular geographic features, very illustrative of the dynamic of rift valley systems.
- Native fauna (wild and domesticated) with special characteristics and interest, as well as introduced fauna (domesticated) typical of the present landscape of the region.
- Native flora (wild and domesticated) with special characteristics and interest, as well as introduced flora (domesticated) also typical of the present landscape of the region.
- Climate conditions with special characteristics and interest (high sunlight irradiation, pure air because of the altitude).

Cultural Heritage

Material Cultural Heritage

- Archaeological sites within caves and rock shelters with important deposits of past human activity together with rock art from different periods.
- Archaeological sites conforming villages and hamlets with high visibility at the moment.
- Different types of archaeological structures devoted to agricultural activities at different times.
- Archaeological objects of different types coming from scientific excavation, illustrative of different periods and processes.
- Historic buildings, such as church, public and private houses or compound, urban or rural.
- Groups of historic buildings and facilities, illustrative of different activities and historical events.
- Historical landmarks, where specific events occurred, such as battles of the independence or civil war.
- Present towns with historical structures and with buildings with traditional techniques and designs.
- Present farms with traditional way of production.

Non-material cultural heritage

- Present knowledge and use of traditional technologies of production.
- Traditional culinary practices, dressing, interchange forms, music and dances still in use.
- Religious and social traditional practices still in use.
- Kinship systems and religious, economic and social networks still functioning.

Assessment of the conditions: opportunities and constraints

Opportunities

- Variety, quality and visibility of natural heritage.
- Variety, quality and visibility of material cultural heritage, illustrative of the local human development.

- Non-material cultural heritage and traditional way of live still active.
- Relation between environment and society tied to traditional ways.
- Availability of quality scientific information coming from different research projects of different sciences (geology, anthropology, archaeology, ethnology, history, architecture, etc.).
- The region is already a tourist destination for domestic and international visitors.

Constraints

- Declining conditions of the local population related to poverty which results in decreasing demography due to migration and the disintegration of the traditions.
- Risk of high impact on the environment and on heritage caused by different agents.
- Conflict of interest among different social, economic and political groups.
- Lack of any kind of facilities.
- Lack of communication among different political and social actors.
- Lack of awareness of the importance and fragility of the heritage.
- Lack of any policy to manage the heritage.

5. How can the cultural and natural heritage of this region be managed for tourism?

To develop a master plan to manage the region in order to preserve the cultural and natural heritage, and to promote cultural tourism, it would be necessary:

- To asses and to register all the potential cultural and natural heritage places, their present condition and their needs and possibilities to be prepared for tourism.
- To convoke all the social, political and economical agents involved in the region to be invited to participate in the design of the plan, looking for consensus.
- To achieve the conformation of a working group bringing together the political authorities, local communities, scientific researchers working in the area, private investors and other social actors to joint efforts to elaborate and to carry out the management plan.
- To ensure the active participation of the local communities because they are the clue to the success of the project.

Even if it is not easy to achieve the items mentioned above, they are a prerequisite to the development of a master management plan.

As examples of the many ways of managing and interpreting this heritage, the following ideas are proposed:

- Coordinate working groups with the local community in order to select and prepare geological, archaeological and historical sites to be opened to the public with the necessary protection and interpretation measures.
- Re-appraise present facilities available at the local museums to offer a better quality of interpretation to the public.
- Promote the education of local human resources to be in charge of the management of specific sites, to guide cultural tours, and to work with the local communities.
- Create interpretation centres, to guide the different interest groups to know and select the specific places they want to visit. The main interpretation centre could be placed in the capital of the province to present for the public the whole range of possibilities that the region offers.
- Present for the public the specific places to be visited, different minor interpretation centres could be located in the most important towns along the main route, with thematic derivations: geological, geographic, archaeological, historical, etc.
- Design cultural itineraries, guided with maps, which will connect different interpreted sites connected among them and with interpretation centres.
- Develop an infrastructure for the interpretation of the cultural itineraries.
- Develop a community cultural centre to coordinate the activities in each of them.
- Develop better tourist facilities.
- Design programs to promote cultural tourism to the region.
- Design programs to promote 'learning travels' for high school and university students to the region.

6. Final considerations

During the last decades, a deeper awareness of the relevance and values of the cultural and natural heritage has reached different social groups at a global level. This awareness brought new ideas for the 'use' of the heritage for different purposes, among which the 'sustainable development' projects are the ones which have attracted major attention.

The 'sustainability' paradigm has gained great importance in recent years and has been applied to the most diverse areas of the country and people's cultural, economic and political lives. Use of this concept in the cultural sphere has been analysed mainly by UNESCO which created a special commission to do that: 'World Commission on Culture and Development' and 'World Commission on Environment and Development'. These

commissions produced several documents, such as *Action Plan on Cultural Policies for Development* or *Our Creative Diversity* where these concepts were analysed and an institutional position was taken, which, in brief, is the following:

> …development must be concerned with 'the flourishing of human existence in all its forms and as a whole' (Isar, 1998).

Following this statement the heritage can be seen as a 'resource' only if its valorization aim to promote 'the flourishing of human existence in all its forms and as a whole' is the objective of the heritage developmental plans and not merely a means of economic growth.

This perspective is adopted in this paper. From this, the heritage is seen as a potential source of spiritual and material growth to the local and international community.

The next steps in the way of the 'valorization' of natural and cultural heritage with sustainable development purposes must include all the social sectors involved and to consider their needs, expectations and points of view. This involves the recognition of the potential conflicts of interest among them (for example, aboriginal people, country communities, big enterprises, etc.) and the necessity of finding ways of agreement and consensus among them.

Taking all this into account the 'significance' of the heritage will be the addition of different 'values' that any particular heritage could have for different groups: symbolic, social, scientific, aesthetic, religious , etc. Thus, the 'interpretation' of that heritage must include all these aspects when the management of them is planned and it will be presented to the public.

That management and presentation will be the pathway to 'sustainable development'. The management and presentation can be carried out through museums exhibitions, cultural and natural parks, cultural and natural itineraries, interpreted archaeological or historical sites, etc. All these will be the 'attractions' to be offered to develop cultural tourism in order to promote sustainable development.

The attractions will be more interesting when they can offer 'different' things. This means that, at the moment, with the advance of 'globalization', the cultural tourists will prefer the choices which give them the opportunity to know 'different realities' than the ones that can be seen in other parts of the world. In this sense the case presented here is a good example of how a remote region can be presented and prepared to 'show' its reality and its uniqueness to visitors coming from everywhere.

On the other hand, the recent local awareness of the relevance and values of the local heritage come together with the necessity of a reinforcement of local identities to face the compulsion of the 'globalization' at planetary scale. The reaction to face this is the necessity to reinforce the 'own culture' as 'different' (not better or worse) than other people's culture.

The 'own culture' in this context, would be the process through which the people living in a specific place or region came to be what they are today, in brief, the history of the relation between the human communities and their environments during millennia, a process which resulted in the present day's cultural landscape. All the different 'cultural landscapes' existing in the present day conform the marvellous environmental and cultural diversity that the Planet Earth has at the moment.

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Looking at the ship under the City: The *Inconstant* and the ICOMOS Cultural Tourism Charter

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Introduction

In 1999 the International Council on Monuments and Sites (ICOMOS) ratified its international charter on cultural tourism (ICOMOS, 1999; www.icomos.org). The charter provides a means to guide appropriate, authentic and sensitive cultural tourism ventures.

A maritime archaeology and conservation project being developed in Wellington, New Zealand, is a good case study with which to test the new charter.

The *Inconstant*

The *Inconstant* was built in Nova Scotia in 1848 (see O'Keeffe, 1999). In 1849, en route from Adelaide to Callao, the ship struck rocks at the entrance to Wellington Harbour (Kelly, 1999: 8). The ship was eventually bought by a young merchant and entrepreneur John Plimmer, who moved the ship to the shoreline of the new city, built a warehouse over the ship's hull and set it up as a floating warehouse (Kelly, 1999: 9). It was affectionately nicknamed Plimmers Ark.

Wellington had a large earthquake in 1855, which turned the *Inconstant* onto its side, and raised the shore around the vessel by about 2 m. Plimmer righted the ship, and continued trading (McKinnon, 1991: 17–19, cited in Kelly, 1999: 11). From 1855 onward, the new expanses of available shoreline were gradually reclaimed for the city, and the *Inconstant* was effectively landlocked by the 1880s (Kelly, 1999: 11).

In 1883 the warehouse over the *Inconstant* was demolished and the ship's ribs were cut down to below ground level to make way for a new building for the Bank of New Zealand (BNZ). The remaining hull was buried beneath reclamation material (Kelly, 1999: 14).

Foundation work for a restoration and refurbishment project, in 1997, on the building above the ship (now known as 'the Old Bank') revealed the *Inconstant*'s hull, intact beneath the reclamation material. An archaeological investigation was undertaken on the ship and its surrounds.

Public interpretation

Following the excavation the bow section timbers of the ship's hull have been left *in situ* in the lower level of the Old Bank. They form the focus of a display about the history of the ship and John Plimmer. The ship's timbers have had a concrete tank constructed around them, and can be viewed beneath glass floor tiles.

The display features a range of interpretative material including artefacts recovered from the site, interactive material and historical photographs. Because of the constraints of the building project the rest of the timbers of the ship's hull were required to be removed from the building site. They are now being conserved and displayed in a space on the Wellington waterfront known as the *Inconstant* gallery.

In contrast with the bow section display in the BNZ, the gallery display is as much about the process of conservation as the story of Plimmers Ark. The ship's timbers are visible in perspex tanks, including one elevated above head height, allowing viewing of the underside of the timbers. The conserved felt and Muntz metal will eventually be re-articulated to these timbers.

The gallery is on two levels allowing various views of the timbers. There will also be some interpretation material here about the *Inconstant* story, to link back to the BNZ display. The gallery is located very near the Wellington Museum of City and Sea, and so links in with the maritime history theme and the stories of Wellington city. It opened in early 2001.

ICOMOS charter

The *Inconstant* project brings together the issues of archaeology, maritime archaeology, adaptive reuse, and cultural tourism. It provides an opportunity to test the project against the principles of the ICOMOS cultural tourism charter. At the same time the usability of the charter may be tested. Both parts of the *Inconstant* display, the Old Bank display with the *in situ* bow section timbers and the re-articulated sections in the gallery, will be considered in this assessment.

Principle 1: Provision of responsible and well managed visitor experience, for visitors and host community.

Both the displays provide an understanding of the history of the *Inconstant* and its various stages of use. Its associations with Wellington and its cultural, social and historical significance are demonstrated for the public consumer. It could, therefore, be argued that the displays are of greater significance to the host community, who will relate to John Plimmer and his associations with the city and region. Wellingtonians are also visitors to the past.

Principle 1.2 of the Charter demands the use of appropriate and contemporary media and technology: the *Inconstant* displays use a variety of visual technology including maps, historical photographs, multimedia and graphics, and sound material to convey the elements of the story

Contemporary education, media and technology are not cheap. The Charter notes that cultural tourism can generate funding, perhaps the adage 'got to spend money

to make money' is relevant. However, this assumes the host community will have the necessary resources to do this.

Principle 2: Conflicting values between heritage places and tourism should be sustainably managed.
There was a degree of conflict between the values and perceived outcomes of the project. The refurbishment of the building had to meet targets of timing and financial viability. Decisions about the remains of the ship balanced *in situ* preservation with the need to remove some parts.

The building itself also experienced conflicts of values, where retention of original fabric was sacrificed for expediency or commercial gain. This is a common tension between heritage practitioners and developers, and the charter gives an additional level of assistance to heritage practitioners, where retention of original fabric or structures can be shown to the developer to be a benefit and potential tourism gain.

Principle 2.3 calls for tourism programmes to be based on a comprehensive understanding of the heritage significance of the place. A conservation plan had been prepared for the building, identifying the *Inconstant* as a key element of its history. However the physical remains of the ship were an unexpected and unplanned-for dimension of the refurbishment work, requiring swift planning and decision making. Obviously good detailed research can mitigate many of the conflicts experienced in the development of cultural tourism.

Principle 3: The visitor experience should be worthwhile, satisfying and enjoyable.
The two displays, the *in situ* bow section and the *Inconstant* gallery, focus on different components of the story. The bow section display is about the story of the *Inconstant* and John Plimmer, and their significance to Wellington. The gallery display is a more technology-focussed area, as much about the process of conservation as about the *Inconstant*.

Observation of visitor behaviour indicates that the *in situ* bow display is achieving a high degree of enjoyment and visitor satisfaction. However, one element of the display appears to be significantly diminishing the experience; ironically, it is the key element of the display. The bow section timbers are visible beneath floor under glass tiles. Originally designed to be one metre square, the tiles are much smaller than this, and the framing used for them significantly reduces the viewing window of the bow section timbers. It appears that some visitors are unable to interpret the timbers, so they leave them without further thought and instead enjoy the supporting information about the history and rediscovery of the ship.

Planning for displays like this should reconcile tension between design elements and conflicting objectives to ensure maximum satisfaction and enjoyment, without compromising safety standards

Principle 4: Host communities and indigenous peoples should be involved in planning for conservation and tourism.
Wellingtonians were involved in the *Inconstant* display, including members of John Plimmer's family.

However, there is a key issue of how we manage this involvement. The current Axford Scholar in New Zealand, Jann Warren-Finlay, is reviewing the historic heritage sector of New Zealand, and among a range of results and observations has commented on the high degree of voluntary work in the sector (Warren-Finlay, in press). This is a common occurrence in many countries, reflecting to a degree the community attitudes towards historic heritage, where it is perceived as being 'a good thing' but not important enough to adequately fund. If heritage is valued in historical, social, and emotional terms, this must translate to financial support.

Principle 5: Tourism and conservation activities should benefit the host community.
Both the Plimmer's Ark displays have a number of benefits to the Wellington community: another cultural tourism attraction, educating the local community, providing a heritage focus on the waterfront, and providing a physical and thematic link to the nearby Wellington Museum of City and Sea. It is providing employment opportunities for project members, local suppliers and craftspeople.

Principle 6: Tourism promotion programmes should protect and enhance Natural and Cultural Heritage characteristics.
The project has protected part of the oldest European history of the Old Bank, and enhances the historical character of the place and its links to Wellington history and the waterfront.

Discussion

The ICOMOS cultural tourism charter provides a framework for all steps in cultural tourism: setting objectives, developing a cultural tourism venture, management and evaluation

A strength of the charter is that it focuses as much on the significance to the host community as to visitors. It refers to engendering of attitudes of respect and understanding to present day historic communities, and the landscape and cultures from which that heritage evolved.

The charter recognises and manages both tangible and intangible values, from physical fabric to traditional building methods to myths and beliefs. It is adaptable: it is applicable to an archaeological site, a museum display or a method of traditional craft. The charter talks about physical, intellectual and emotional access.

The methods noted have clear benefits to host communities, through issues of revenue distribution, use of indigenous people for interpretation, guiding and other activities. It encourages a coordinated approach, linking the heritage and tourism aspects with the

commercial needs, recognising the specific needs of each and resolving conflicts. A key objective is sustainability of the heritage places and living cultures. It addresses the realistic tensions between conservation and viable tourism.

However, it is considered that the charter also has some weaknesses.

It does not appear to relate to aspects of heritage conservation issues or good practice, such as utilising existing heritage fabric, or differentiating between original/authentic and new material. 'Integrity' is mentioned in the opening preamble; principle 2.4 refers to authenticity, local materials and vernacular traditions; but this is not enough.

There is the potential for inappropriate heritage conservation practice—as long as the work is perceived to be authentic and uses local materials it may or may not be appropriate heritage conservation.

The charter objectives note the support of wider initiatives by ICOMOS and others in maintaining the integrity of heritage management and conservation. Perhaps the charter needs to go a step further than this and cross reference to other ICOMOS charters to ensure consistency and appropriateness of practice and definition; for example, the ICOMOS Charter for the Protection and Management of Archaeological Heritage (1990) stresses *in situ* preservation.

There is an issue with the financial elements: many of the objectives and methods are expensive, and assume the host community has access to sufficient funding. The charter could be placing too high expectations or requirements on host communities with lesser resourcing.

Conclusions

The *Inconstant* project fulfils many of the objectives of the cultural tourism charter. It appears in fact to be a good example of the need for such a charter, demonstrated in aspects of the project including the unexpected rediscovery of the ship; the conflicts between the values of the ship and the refurbishment project; the identification of the heritage and cultural tourism potential of the ship; and, the development of the themes and elements of the final displays.

The ICOMOS cultural tourism charter also passes the test, in providing a relevant, adaptable, and useable set of guidelines for cultural tourism.

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Dripstones: Rudimentary water filters on ship and shore in the 18th century

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Introduction

A great many objects or items of equipment found on ships had their origins ashore. To assist in the interpretation of these objects or equipment, and particularly when found on shipwrecks in an archaeological context, it is useful to thoroughly understand their place in the broader perspective.

There are few things as important to man's survival as fresh drinking water. In historical times, all too frequently, the quality of the water available was extremely poor, or indeed, unhealthy.

For millennia, naturally porous limestones and other porous media have been used for the filtration of particulate matter, insects, or *animalculæ*, from fresh water. In the case of limestone or sandstone, the natural stone was carved into a distinctive form and given the English labels 'percolating stone', 'filtering stone' (*pierre à filtrer,* Fr.), or later, 'dripstone'.

Natural needs for sufficient supplies of potable water, meant that early human settlements were nearly always situated as near as possible to a good freshwater source. Until a consciousness of community hygiene was forced upon the populace by some authority's regulation, little care was taken to ensure the continued purity of the settlement's water supply and frequently, as a population centre grew, its water supply became increasingly polluted.

Ships had an additional problem. Commonly obtaining their water supplies from a populated port, it was already polluted when received. Oak casks, in which water was stored on board ships in England and many European countries, absorbed a certain amount of their contents and water stored in contaminated casks soon became odorous as resident organisms bred and developed making it undrinkable.

The problem was not a new one. It appears that the Japanese and Egyptians from a very early period used vessels of porous stone, or of unglazed earthenware, for the purpose of filtering water.

> The stone was hollowed out into the form of an apothecary's mortar, or was made shaped like a half-egg, small external projections being left at the open top for resting upon a wooden frame which supported it. Water poured into this vessel passed through the porous rock and, collecting at the point of the base, dripped into a container placed below to receive it. The solid impurities in the water being larger than the pores of the stone, were retained, and could be cleaned out as often as it was found desirable (Tomlinson 1853: 655).

In time, the use of dripstones spread to other regions through the avenues of conquest and early maritime trade, and travelled around the Mediterranean Sea to find a permanent home in Spain where, today, a form of the early stone is still used for the separation of particulate matter from water and wine (Shilstone 1954: 82-3). In 1879, '*alcarrhazas*' were described as 'filter vessels of porous biscuit stoneware made in Spain' (*Encyclopedia Britannica* [*E.B.*], 1879: 167).

An examination of a few of the localities and situations where dripstones are known to have been used in the 18thcentury, i.e. London and Paris (*E.B.*1879: 167; Burney 1815: 146), Tenerife in the Canary Islands (*E.B.*, 1879: 167; Irving, 1936: 22), Barbados (Shilstone, 1954: 82–3; Devendish, 1986: 18; Fraser, 1990) and Jamaica (Cassidy, 196: 84) in the West Indies, Spain (Shilstone, 1954: 82–3), Norfolk Island in the western Pacific, Port Jackson (Sydney) and Tasmania in Australia (Stanbury & MacLeod, 1989: 1–10), and on board the ships HMAV *Bounty* (Irving, 1936: 22; Rutter, 1935: 44), HMS *Pandora*, USS *Essex*, and the merchant ship *Cumberland* (Stanbury & MacLeod, 1989: 1), elicits an appreciation of the reasons for their being used there and elsewhere.

Water purity and dripstones on shore in the 18th century

London, during the 18th century, was a prime example of a situation where the local water supply was polluted with sewage and filth with the growth of population. According to Mingay, much of the city's water was taken from the Thames river. With the expansion of noxious trades along the river's banks such as dye-works, paper mills, breweries, and tanneries which drew their water from the river and dumped their waste back into it, the water became increasingly unfit for consumption. On hot summer days the stench from the river was so objectionable that at one time, it was suggested that the Houses of Parliament be re-located to a more suitable place. Mingay (1975) also tells us that London women were often seen

> ...dipping water from a foul foetid ditch, its banks coated with a compound of mud and filth, and with offal and carrion—the water to be used for every purpose, culinary ones not excepted.

Many families relied on shallow wells whose water filtered through refuse-filled yards or drained through nearby burial grounds (Mingay 1975: 150–2).

It is little wonder that the use of some form of filtration was deemed essential in the more affluent households of 18th-century London, and that water was not generally

Figure 1. Barbados double-dripstone alcove at Fisherpond plantation. From Fraser (1990). Photo: Felix Kerr.

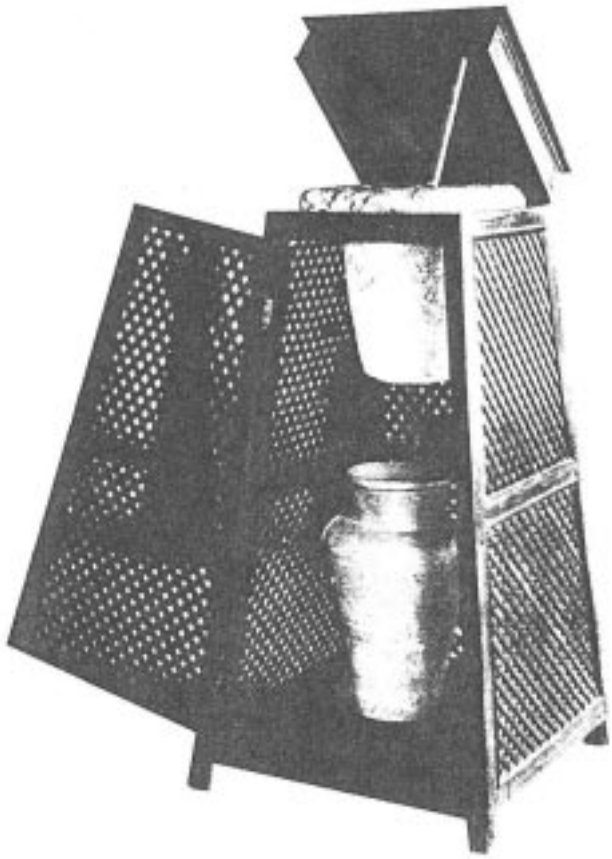

Figure 2. Dripstone case. A Barbados dripstone and earthenware receptacle. Probably similar to that on the quarterdeck of *Bounty* when the mutiny occurred in 1789. Jamaica People's Museum, Spanish Town, Jamaica. Photo: R.C. Ebanks.

drunk without first mixing it with wine or spirits or boiled and served in the form of coffee, tea, or chocolate.

In Europe, as population centres grew, so did the residents' distance from central water collection points and the necessity, for those who could afford it, to purchase their supplies from water carriers. Of course, water carriers did not go any further afield than necessary for their supplies. Consequently, their merchandise was no more pure than the nearest polluted source.

The origin of the concept of reticulation, or piping water from its source to a point of convenience or need is lost in antiquity. The Romans built aqueducts and earthenware pipe systems to bring water to their population centres. Other early civilisations in Asia, Asia Minor, and the principal Pre-Columbian civilisations of Central and South America also had elaborate systems of water diversion.

The 18thcentury saw the emergence of private water supply companies in London who piped water directly to the homes of their subscribers. Initially, the enterprises were based upon the idea of convenience of having water 'on tap' with little regard to the purity of the water supplied. As an example, the Grand Junction Water Company pumped its water from a point on the Thames river directly opposite the Ranelagh sewer (Mingay, 1975: 150–2). It was up to the customer to filter, boil, or otherwise purify the water.

As competition between the several London water companies grew, some began to seek purer sources more remote from the city centre.

Whilst the idea of channelling the water supply from a distant source was originally inspired by the convenience of not having to transport it in containers, and the water quality was subsequently improved as a result of commercial competition, it also had an advantage which was not truly recognised until relatively recent times. It separated the water source from the source of human pollution, thus reducing the frequency of contamination and waterborne disease.

Of course the average Londoner could not afford such luxury. James Simpson is given credit for constructing huge sand filters for the purification of the London water supply in 1827 (Pascoe, 1974: 477)

London was certainly not the only densely populated metropolis with water purity problems. In the middle of the 18thcentury a source of stone suitable for dripstones was discovered in the Picardy region of France (*E.B.* 1879: 167) and in 1815, Englishman James Burney (1815: 146) comments on 'the common filtering-stone, which has been used with so much advantage at Paris for the last thirty-five years'. Stanbury and MacLeod (1989: 1–10)

Figure 3. Dripstone case. This example was used in rural Jamaica until the 1950s. Photo: A.R.D. Porter.

discuss the use of dripstones in 18th and early 19th-century Port Jackson and Tasmania which suggests that the new settlements in Australia were becoming sufficiently populated to pollute the local water sources around which they had grown.

In the case of Tenerife in the Canary Islands, Barbados, and several other of the West Indian islands, the year-round supply of fresh spring water was inadequate and there was a heavy dependence upon stagnant standing water from rain water catchments such as ponds, and even swamps when the seasonal streams were not flowing (Mercer, 1980; Fernandez-Armesto, 1982; Hoyos, 1978; Shilstone, 1954; Andrews & Andrews, 1927: 60–61).

By their early appearance there, it is safe to assume that it was from Spain that dripstones were introduced into the Canary Islands at the beginning of the 16th century and the Spanish settlements of the West Indies about the same time. In turn, it was Tenerife and Barbados which provided some excellent raw material for the filters and were to become important sources of the manufactured article. Indeed, it was from Tenerife that a large proportion of dripstones were imported into England (*E.B.,* 1879: 167), and it was mainly from the coralline limestone quarries of the 'Mount' plantation, in the parish of Saint George, Barbados, that other islands in the West Indies, and possibly North America, were supplied (Shilstone, 1954: 83).

A common feature of plantation 'great houses' in the West Indies, and particularly in Barbados, was an alcove of stone or brick which often housed two dripstones, one above the other, and a collecting vessel beneath (Fig.1) (Fraser, 1990: 18). Externally, the dripstones were much the same in proportion. The uppermost had a deep cavity into which the water to be filtered was poured. Due to the thinner wall section at the base of the cavity through which the liquid was to permeate, the upper stone would have served as a receiving vessel and pre-filter, removing only the grossest of particles. The second stone, however, had a shallower cavity, and consequently a thicker stone base through which the water must pass. Beneath the two stones was placed an earthenware container to collect the filtered water. In the West Indies, from the 18th century, the earthernware receptacle was frequently a recycled olive oil jar containing approximately 20 gallons (91 l) (Shilstone, 1954: 83).

Another arrangement commonly used was a wooden cabinet or 'case' which generally only held one dripstone and the collecting vessel. The sides of these cases were frequently open lattice work for the freer circulation of air to aerate the dripping water and to disperse any offensive odours (Figs 2 & 3).

Water purity and dripstones on ships

It is useful to regress for a moment in order to put into perspective the water purity problems encountered on ships. Not one, but several factors were contributors to the difficulty. These factors can be placed in two very general categories; pollutants which caused sickness or disease, and pollutants which caused objectionable flavours or odours. Often one contributed to the other and at that time, when water chemistry and pathogens were not fully understood, there did not seem to be a single, universal, answer.

Leeuwenhoek, a Dutch scientist, is attributed with being the first to recognise and to produce drawings of bacteria in 1683. However, it was not until 1856 that French chemist, Louis Pasteur, began study leading to the understanding of bacteriology (Pascoe, 1974: 375, 509).

Apart from pollution caused by minerals in suspension and rotting animal and vegetable matter, insect-borne sicknesses were a major problem. In the tropics, mosquito transmitted fevers including varieties of malaria, dengue, and yellow fever were prevalent. The earliest reliable account of yellow fever, referred to as 'Yellow Jack' or 'the

Black Vomit', dates from 1647 in Barbados (Pascoe, 1974: 351). Long (1774, **2**: 578-9) says:

> The lagoon water [of Jamaica], being the constant seminary for muskeetos [*sic*], is loaded with the eggs and dead bodies of these insects. It swarms besides, with numbers of other animalculæ; and is further corrupted with stinking aquatic plants and filthy ooze. I have even known them [mosquitos] hatch in lime-water… '

While chlorine gas was perhaps known from the 13th century, it was six centuries later, in 1823, that Faraday was successful with experiments to liquify chlorine. However, it is not until 1896 that we find the first record of water chlorination being used during an outbreak of typhoid in Italy (Pascoe, 1974: 429, 472, 559). Today, chlorine in liquid, tablet, or powder form, is one of the most common of chemical water purifiers.

Many methods were attempted to cleanse the interiors of ship's wooden water casks and/or to chemically improve the quality of the water they contained. In 1785, Abbé Tessier, Member of the French Academy of Sciences and of the Society of Medicine, wrote to the Pacific explorer Lapérouse outlining a series of ten experiments which were to be conducted during the Captain's forthcoming scientific voyage around the world. He began his letter by saying:

> One of the most disagreeable circumstances attending a seafaring life is the necessity of drinking putrid water on distant voyages.

Most of the experiments he proposed involved the boiling of the water, the coating of the casks with 'quicklime' or tar, and the addition of 'vitriolic acid' to the contents. The simplicity of the approach is not necessarily a comment upon the level of chemical knowledge of the day. Rather, Tessier suggests that he was seeking a 'cheap' and easy method which would be simple to attain on any ship by officers of limited chemical knowledge (Milet-Mureau, 1799, **1**: 149–155).

While boiling might neutralise bacteria and other organisms, it was also in 1785 that Englishman Dr. Gilbert Blane stated that boiling would not expel the 'putrid effluvia' and promoted the technique of aeration to improve flavour and odour (1785: 311–12, cited by Sulivan, 1979: 161).

Inventions, such as 'Orsbridge's machine for sweetening water', were to eventually find favour on ships and, indeed, were issued to Royal Navy vessels (Sulivan, 1979: 161–2). Orsbridge's process, through more efficient aeration, effectively reduced the water's objectionable odour although, it had little benefit as a filter. There remained the problem of removing the particulate matter in suspension. Consequently, the use of a porous filter medium was never abandoned. The principle is used in one form or another to the present day.

Stanbury and MacLeod (1989: 1–10) discuss the finding of one intact and one broken dripstone on the wreck of the merchantman *Cumberland* (1830) and put forward a strong case, based upon historical documentation and MacLeod's stone analysis, in support of the premise that the *Cumberland* dripstones came from Norfolk Island in the western Pacific. They also refer to a dripstone supplied to the Purser of the American frigate USS *Essex* by Thayer and Chapman of Boston in 1799 and state that one was also included among the ship's Captain's personal stores. These latter were possibly from Barbados.

Burney (1815: 146), in his revision of Falconer's 18th-century *Marine Dictionary*, says of dripstones:

> They are very necessary in ships at sea when the water becomes foul, and on that account each ship in the Royal Navy is furnished with one for the use of the captain or commander.

It would seem the common seamen were not thought to need clean water. Indeed, according to Rodger (1988: 91–2), sailors of the Royal Navy seldom drank water which was not mixed with wine or spirits, and then only after the ship's supply of beer ran out. The ship's water supply was mainly for the steeping of salt meat, and the cooking of 'pease' (peas), barley, and other dry stores.

Lieutenant William Bligh apparently had other ideas in 1787 when His Majesty's Armed Vessel *Bounty*, of mutiny fame, called into the Canary Islands en route to Tahiti. Bligh later writes:

> …I also directed the water for drinking to be filtered through dripstones that I had bought at Tenerife for that purpose (Irving 1936: 22).

A note in *Bounty* 'mutineer' James Morrison's *Journal* says of their visit to Tenerife 'two dripstones were purchased here for refining water'. In describing the mutiny, he also makes reference to Fletcher Christian keeping his sextant on the 'dripstone case' which was situated on the quarterdeck (ML Safe 1/42: 1b). The receptacle beneath the stone would serve as the 'scuttlebutt' for the crew's convenience. It would appear that Bligh kept the second dripstone for his own use.

A dripstone has been recovered from the wreck of HMS *Pandora*, the frigate dispatched by the Admiralty in 1790 to capture the *Bounty* mutineers and subsequently wrecked on Australia's Great Barrier Reef. It is likely that the stone, very probably imported into England from Tenerife, was issued as standard equipment by the Chatham Naval Dockyard stores when the ship was fitting-out for the voyage. Before departing England, *Pandora* was especially issued with a six gallon (27.3 l) 'stone' jar which would have been utilised to collect filtered water from the dripstone (NMM CHA/B/1). This suggests that the Navy only issued the dripstone and

that the case or stand would have been the responsibility of the ship's Carpenter to build.

Burney (1815: 146) describes the Tenerife filtering-stone as 'a soft white stone, fixed in a stand and hollowed at the top', and says of the French dripstone, 'it is a yellow free stone, of a middle sized grain, soft enough to be cut with a toothed saw, and admitting its grain to be rubbed out by the fingers'. He goes on to say:

> An easy and effectual method of purifying water, [it] is of such constant utility, as to render it a matter of greater importance than it may at first appear.

One of the disadvantages of dripstones was the necessity to frequently clean their inside surface with a brush. The stone, being so soft, was within a fairly short time rubbed thin thus becoming less effective. Another objection was the 'noxious mineral quality, which the pumice, or common filtering stones are justly suspected to communicate' (Sulivan, 1979: 162, citing *Naval Chronicle,* 1799, **2**: 331–6). This latter objection was probably justified but may have been partially related to the detritus trapped within the porous stone and which no amount of scrubbing could remove.

The supply of natural stone filters from the possessions of one of England's frequent enemies was at times precarious. At the time when England was once again threatening war with Spain over the 'Nootka Controversy' in 1790, Mrs Johanna Hempel lodged a patent application for one of the country's earliest mass-produced artificial dripstone-style water filters. It was a supported basin made of fired kaolin or pipe clay and contained coarse sand (*E.B.,* 1879: 167). The advantages of this design was that the polluted sand could be either rinsed or replaced, the basin could be easily cleaned, and the materials were locally available. It was not a new idea. In 1774, Edward Long (**2**: 577–8) described the making of sand filters made from half-casks or wooden tubs.

Iron water tanks began to displace oak casks on ships during the first half of the 19th century. As a consequence, the quality of water carried could be maintained for longer periods and, with the introduction of steam-powered ships which had more direct, and consequently speedier, passages than sailing ships, the necessity to filter ship's water declined. Today, modern technology has provided the de-salinator which greatly reduces the volume of stored water ships must carry.

The dripstones of Jamaica

Several hundreds of dripstones may be found throughout the West Indian Islands today. Those found in Jamaica appear to be representative of the two major dripstone sources, i.e., Barbados, and Tenerife (A.R.D. Porter, 2001, pers. comm.).

European occupation of Jamaica commenced when the first Spanish settlers arrived there in 1508. It was officially established as a colony the following year. The Spanish were to remain for 146 years until the British captured the island in 1655 and maintained it as a colony for three centuries (Porter, 2001: 247–8).

Long (1774, **2**: 24–5, 577–9) claims that the Spaniards employed two methods for purifying Jamaican water. One was by the settling of suspended impurities in large earthenware jars and the other by the use of 'percolating stones' (dripstones). These methods continued to be used by the English after their occupation of the island.

Sir Hans Sloane visited Jamaica in 1688 and was later to write:

> The porous Stones for percolating water is the best remedy...[for muddy sediment in drinking water]...; they must be clean'd every day, and sometimes the water put through them twice or thrice. They are brought from the Canaries to the Spanish Main, and thence to Jamaica. They are made into the form of Mortars, the water being put into their Concave side, foul and troubled, passes through them, and is filtred [*sic*], leaving its filth in the pores of the stone. Sometimes this water is pass'd through three of these plac'd one under another (Sloane, 1707, **1**: x–xi, cited by Robertson, 1990: 100; and Porter, 2001: 238).

Browne (1756: 63–4) says of:

> The percolating stone…This stone is frequently introduced here [Jamaica], in the manufactured state; and found to be very beneficial to the inhabitants of the lower lands, as it serves to cool, as well as to purify the waters commonly used in their diluted drinks.

The identification of Barbados dripstones in Jamaica has been confirmed by Porter (2001, pers. comm.). Firstly, on the basis of consistent form. These stones have a thick, square, rim to permit their being suspended in a frame. The lower body section is essentially an inverted truncated cone with a very slight convex rounding from top to bottom and a flattened base (Fig. 4). A huge number of dripstones of this form are found in Barbados today. Secondly, on microscopic analysis of the natural stone which he identifies as 'calcarenite' and says:

> Geologically speaking, a calcarenite is a limestone composed of consolidated calcareous (usually calcium carbonate) sand-sized particles. Under the microscope the Barbados material can be seen to consist of particles of coral skeletal debris , coralline algae, and broken fragments of shells, echinoids and forams. The material is poorly cemented so particles can be rubbed off with the fingers. The original rock is a Pleistocene-age reefal facies and is estimated to be about 250,000 years old (Fig. 8).

The identification of what are believed to be Tenerife dripstones in Jamaica must be considered circumstantial at present. Unfortunately, as this goes to press, samples and geological information which Porter (2001, pers.

Figure 4. Typical calcarenite (coral limestone) dripstone from Barbados. (See Figure 7 for dimensions.) Weight 136 lbs (62 kg). Brandon collection. Photo: A.R.D. Porter.

Figure 5. Recovered from the wreck of HMS *Pandora* (1791), this dripstone is suspected to have come from Tenerife. Rim 15 $^{1}/_{4}$ in (390 mm) square; Rim thickness 4 $^{1}/_{2}$ in (113 mm); Height overall 15 $^{1}/_{8}$ in (385 mm); Cavity diameter 11 $^{1}/_{2}$ in (290 mm). Photo: Courtesy Queensland Museum.

comm.) requested from Tenerife had yet to arrive. However, he says of the suspect Jamaican examples:

> ...microscopically the material is quite different from the Barbados stone. Under the microscope the sand-size grains or particles are more rounded, and consist of clear glassy-looking quartz, black biotite, some feldspar and other minerals. In short, it is a poorly cemented impure sandstone that formed in a marine environment from an igneous parent material (possibly a granite or similar rock type). The cementing material is calcium carbonate (Fig. 9).

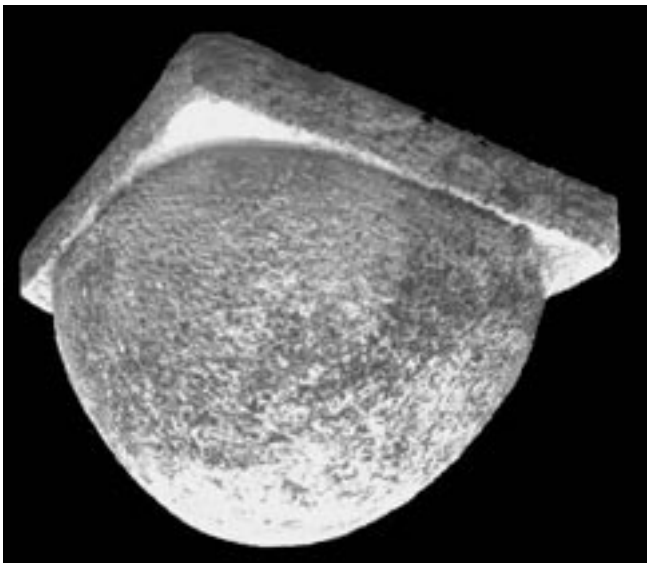

Figure 6. Jamaican (sandstone) dripstone suspected to have come from Tenerife. Note the parallel sections where the lower body joins the underside of the rim. Rim 22.5 x 23 in (571 x 584 mm); Rim thickness 3.5 in (90 mm); Height overall 16.5 in (419 mm). Gardner Collection. Photo: A.R.D. Porter.

The form of these latter dripstones are identical in every respect, (except dimensions), to that which was recovered from the wreck of HMS *Pandora* (1791) (Figs 5 & 6). As discussed earlier, there is some reason to believe that the *Pandora* stone came from Tenerife. This particular dripstone has been in the sea for two centuries and it is incrusted with a layer of more recent marine material, also bound by calcium carbonate, and thus difficult to examine microscopically. However, there does appear to be a small stylistic detail which is characteristic of both the Jamaican examples and the *Pandora* dripstone. This is evident at the juncture of the square rim and the rounded or 'egg-shaped' lower body along the four sides of the rim. It will be noticed, particularly in Figure 6, that the join is parallel to the sides of the rim for some distance on each side resulting in a slightly flattened, semi-elliptical area on the four sides of the rounded shape. This indicates a sameness of a localised traditional method of cutting and forming the dripstones from the natural stone suggesting that they came from the same source.

Browne (1756: 64) claims that the stone from which the Barbados dripstones were made was also native to Madeira. At this stage, it is not clear if dripstones were actually produced in Madeira. However, whenever England was at war or at diplomatic odds with Spain, Madeira, being a Portuguese possession after 1640, was the alternative to Tenerife as a stopping place for English ships crossing the Atlantic. Sloane (1707, **1**: x–xi) describes Tenerife dripstones being first circuitously shipped to 'the Spanish Main' and then shipped to Jamaica. Certainly at the time of Sloane's visit to the West Indies in 1687–88, the English in Jamaica were not on favourable terms with

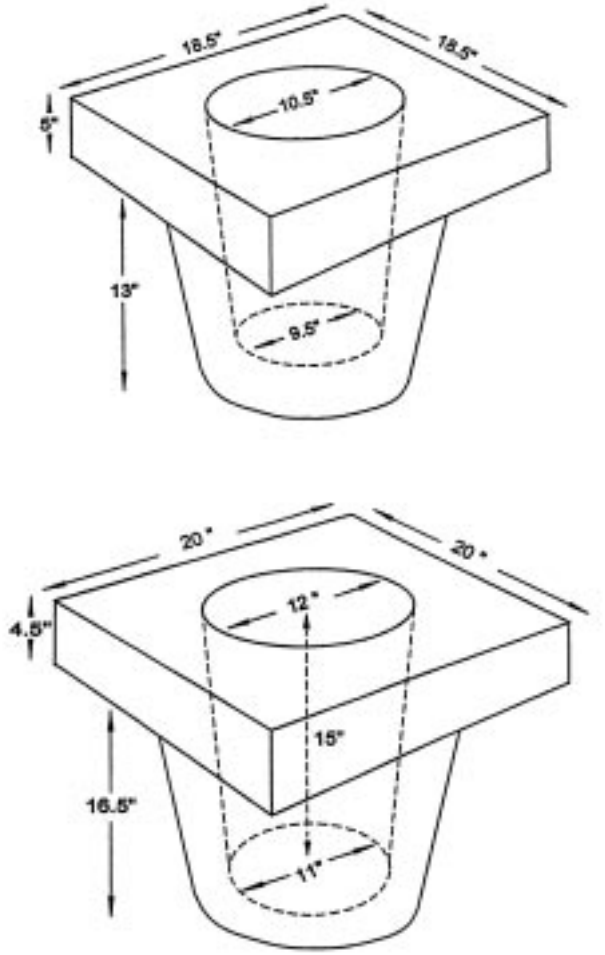

Figure 7. Barbados dripstone. Drawing: A.R.D. Porter. Measurements in inches. The above dimensions are the most frequently encountered and probably represent the standard size for the exported Barbados dripstones.

Figure 8. Calcarenite (limestone) dripstone material from Barbados. The sharp skeletal texture of the raw stone is very evident. Photo: A.R.D. Porter.

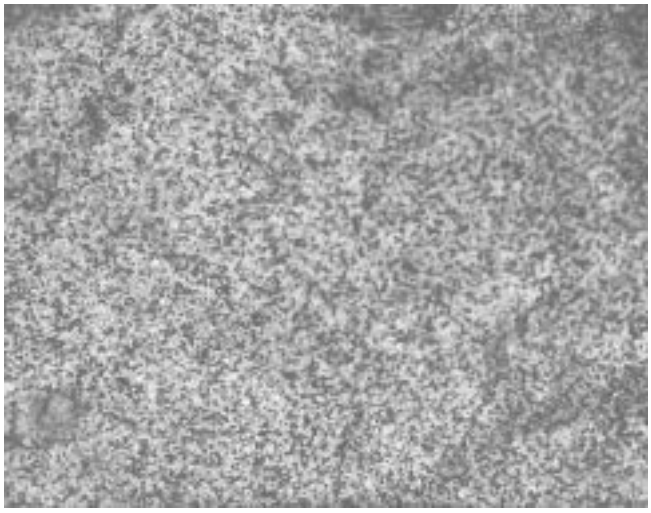

Figure 9. Sandstone dripstone material suspected to originate in Tenerife. Photo: A.R.D. Porter.

Spain. From about 1666, the notorious buccaneer, Henry Morgan, began operating against the Spanish from Port Royal under rather loosely interpreted commissions issued by the English Governor. At the insistence of the Spanish Court in 1672, Morgan was sent to England to stand trial as a pirate. The action was a placebo to satiate the Spanish but the English King turned it into a blatant diplomatic insult. Morgan returned to the island with both a knighthood and an appointment as Deputy Governor. He died there in 1688 (Gosse, 1934: 156–60).

General historical summary

The use of a water filter medium, such as a porous stone or porous earthenware, seems to have a long history dating from early Egyptian and Japanese dynasties (Tomlinson 1853: 655). It would also appear that the occurrence of suitable natural material for the manufacture of dripstones was geographically widespread and the discovery of sources of stone was frequently a product of local demand as necessitated by poor water supplies.

Dripstones were a commodity of maritime trade and those manufactured in, say, the Canary Islands, the West Indies, France, or Norfolk Island in the Pacific, could end up anywhere in the world. Certainly, it can be shown that dripstones were a commonplace appliance to be found in domestic situations until the early 20th century (indeed, a few are occasionally used in the West Indies to the present day), and, either as an item of equipment, or as cargo, on board ships from at least the 16th to the 19th centuries.

Contemporary sources tell us that dripstones were imported into the English colony of Jamaica from both Barbados and Tenerife, in the Canary Islands, and that

'most' dripstones imported by England came from Tenerife (*E.B.,* 1879: 167). We are also told that, at least in the 18th to early 19th centuries, dripstones were issued to Royal Navy vessels for the use of their Captains or Commanders (Burney, 1815: 146). Pending confirmation, there is reason to believe that the *Pandora* dripstone, recovered from Australian waters, and being distinctly different in both form and material to those of Barbados, originated from Tenerife thus further illustrating the global dispersal of this useful object.

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Going down?: The foundering of the National Historic Shipwrecks Program

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Introduction

This is a brief summary of a presentation made at the 20th Australian Institute for Maritime Archaeology annual conference. More details are contained in the two attached appendices.

It was prepared at a time when the commitment to the Australian Historic Shipwrecks Program including the level of funding from the Commonwealth Government (Department of the Environment and Heritage) was in decline. This was evidenced by the drop in the annual budget allocation to all the Australian States, the Northern Territory, Norfolk Island and AIMA from $460 000 in 1999/2000 to $330 000 in 2000/2001. It was also witnessed by the reluctance of this Department to review the program and legislation. The last review of the program was in 1990 and only selected recommendations were enacted from that review (Kendall, 1990), and the last amendments to the legislation were made in 1985 (Jeffery, 1999: 13).

Yet the interest in the Program from the general community and visitors to Australia is increasing. The number of visitors to shipwreck sites and maritime museums throughout the country is in excess of one million annually and the economic gain from this is substantial (see Appendix 2). On one shipwreck site in Queensland, that of the SS *Yongala*, dive charter operators are taking over 5 000 divers annually to the site and making in excess of $1 million, and associated businesses are reaping the financial benefits from the visitors to the region. However, it is not possible for the managers of the site (the Commonwealth Department of the Environment and Heritage, and the Queensland Museum) to recoup even A$1 to help manage the site. The *Historic Shipwrecks Act 1976* does not allow for this and, as already stated, is not likely to change as it needs amendments to the legislation.

Given this environment, the aims of the presentation were to see how the Program could move ahead. Some of the issues considered, and elaborated on in Appendix 1 are:

- The origins—the 1960s and 1970s (Green, 1975, 1977; Henderson, 1986);
- The shipwrecks (maritime archaeology) program in 2000;
- Positive outputs/aspects;
- Negative outputs/aspects;
- Thoughts for a future program;
- A focus for a future program;
- Project outline;
- Project process and goal;
- Future activities required.

An additional, recent issue of some relevance to the Historic Shipwrecks Program has been the review of the Commonwealth's new heritage regime. The Commonwealth Government sought to change the protection of its National Heritage through amending the *Australian Heritage Commission Act 1975*. Legislation was introduced into Parliament in December 2000 and as part of this process it was referred to a Senate Committee. AIMA made a submission to the Committee, which is attached as Appendix 2. The Committee's comments on shipwrecks are worth noting here (Allison, 2001: 37–38):

> **Shipwrecks**
>
> 2.98 Both the Australian Institute for Maritime Archaeology (AIMA) and the Australian Council of National Trusts also made submissions in relation to the importance of protection of shipwrecks. The National Database of Australian Shipwrecks currently encompasses over 6,500 shipwrecks. AIMA is concerned:
>
> [T]hat the present review of the Commonwealth Heritage Legislation does not include the Historic Shipwrecks Legislation. This implies that shipwrecks are not part of Australia's heritage and that this will further marginalise shipwrecks as part of our heritage, particularly in the eyes of the Australian public and government agencies.
>
> 2.99 AIMA also points to the particular difficulties involved in the protection of historic shipwrecks:
>
> There are no 'owners' that contribute financial support, as in the built heritage, and there are only a scant number of community groups that contribute to the protection and understanding of maritime heritage—and a handful of government and community museums, compared to the hundreds of general heritage museums and groups.
>
> At the same time, recreational diving and both recreational and professional fishing have a considerable impact on historic shipwrecks. Much of this impact is due to a lack of awareness of the

impact of their activities. With fishing activity, anchors and trawl nets often cause severe damage and dispersal of shipwrecks without the owner being aware of its presence in the first place. In other cases, fishing is being carried out illegally on historic shipwrecks intentionally but due to a lack of resources to monitor this activity, it continues undisturbed.

2.100 The Committee appreciates the particular difficulties involved in historic shipwreck protection. However, the Committee notes that, as with movable heritage discussed above, the principle protection for shipwrecks is provided by the Commonwealth *Historic Shipwrecks Act 1976*. The current Bills are not intended to displace this primary act, but rather to add a layer of additional protection to those particular shipwrecks that are considered to be of national significance and are listed on the Commonwealth or National Heritage lists.

2.101 For these reasons, the Committee concludes that proper consideration has been given to both these issues in the Bills.

It is proposed that the new legislation, currently the *Environment and Heritage Legislation Amendment Bill (No. 2) 2000* will provide for two new lists, the National and Commonwealth Heritage Lists. The National list will only register and protect a small number of nationally significant sites—perhaps only a few hundred, and the Commonwealth list will register and protect sites under Commonwealth control, again most likely only encompassing a few hundred. This would appear to be a major anomaly with the way shipwrecks are currently handled, i.e. through the protection of the 5000+ 'nationally significant' historic shipwrecks that are located on land owned by the Commonwealth.

Summary and recommendations

The present Commonwealth Government would appear to be happy with the current state of the *Historic Shipwrecks Act 1976* and the associated Program. Correspondence from Senator Nick Bolkus (a Labour member of the Senate Review Committee) in correspondence to AIMA stated that:

> The Government's review of general heritage legislation is now complete and the Government introduced legislation into the senate on Thursday 7 December to reform the Federal heritage protection regime. The legislation amends the Federal *Environment Protection and Biodiversity Conservation Act 1999* to incorporate the new heritage regime and replace the current *Australian Heritage Commission Act 1976*.
>
> There is certainly a pressing need for better protection of Australia's heritage and reform of outdated laws. However, a number of concerns have already been raised regarding the Bill, including your concern that historic shipwrecks are not included in this process.
>
> The Senate therefore referred the legislation to the Environment, Communications, Information Technology and the Arts References Committee for a public inquiry and report by 28 March 2001. The Inquiry is not restricted to the legislation and presents an opportunity for due consideration of your concerns.
>
> I encourage you to make a submission to the Inquiry, in which I will be participating. However, irrespective of the Inquiry and when in Government, Labour would be prepared to review the adequacy of the *Historic Shipwrecks Act 1976* and program funding for historic shipwrecks.

Maritime archaeology practitioners located in the state agencies are concerned about the level of commitment being provided by the Commonwealth Government, and figures contained in Appendix 2 highlight the dichotomy between the States' and Commonwealth's commitment to the Commonwealth Program.

It is recommended that without much effort or great increase in finances the Historic Shipwrecks Program could be refloated. The recommendations are to:

- Develop partnerships—government and non-government, universities, community groups, and formulate and implement collaborative projects;
- Need a balance of activities—not just tourism, or archaeological, or management drawing on Edmonds, *et al.* (1995) but extending it into these other areas;
- Review and amend shipwrecks legislation and other legislation affecting historic shipwrecks;
- Establish a fund or avenues for funding;
- Establish a National Maritime Heritage Council to promote the Program with the Minister and the community, so it is not just bureaucrats driving it;
- Appoint a Head of Council—a champion—for promoting the cause.

The focus for the Program should become theme (historical) based and have as its focus:

> *A National collaborative project that includes shipwrecks within the broader maritime heritage picture and that has as an outcome—an Australian Maritime Cultural Identity—which can be clearly seen and understood by the community.*

The goal would be to:

> *Establish National, State and regional focal places, which could include exhibitions, publications and promote real and virtual tours of Australia's Maritime Cultural Identity.*

The fate of the program is with the Commonwealth Government.

Recent initiative

A meeting of the members drafting the UNESCO Convention on the Protection of the Underwater Cultural Heritage (including Australia) on 7 July 2001, decided to agree on the final wording of the Convention. It will now be submitted for adoption at the next session of the General Conference of UNESCO in Paris on 15 October 2001, where it will have to be approved by two-thirds of UNESCO's 188 Member States. The Australian Government takes very seriously its involvement in the international treaties (conventions) and this has a direct impact on its domestic legislation and government practices.

> It is a requirement that any treaty entering into force for Australia be able to be implemented in Australia. Thus, legislation (Federal/State/Territory) will need to be in place when the treaty enters into force for Australia, as will any changes to the practices of Departments/agencies necessary to conform to the treaty. AG's [Attorneys General] can advise on whether existing Federal, State or Territory law conforms with the provisions of the treaty or whether new or amending legislation is needed.

From http://www.austlii.edu.au/cgi-bin/disp.pl/au/other/dfat/reports/infokit.html (accessed 27 July 2001)

The implications of the UNESCO Convention are that the *Historic Shipwrecks Act 1976* needs to be reviewed to see if there are any discrepancies between the way Australia manages its domestic underwater cultural heritage, and the way it has agreed to manage international underwater cultural heritage. Not long after the UNESCO Convention was agreed upon, Senator Hill (Minister for the Environment and Heritage) in a letter to AIMA (July 2001) advised that the *Historic Shipwrecks Act 1976* will be reviewed as part of the development of a National Maritime Heritage Strategy.

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Appendix 1

The Commonwealth Historic Shipwrecks Program

The following information is a brief summary of some of the main features of the program. It is not meant to be exhaustive, merely an indication of some of the main activities implemented and the outcomes in context with the heading.

The origins—the 1960s and 1970s

The Western Australian Maritime Museum's program on shipwrecks conducted during the 1960s and 1970s implemented a state program on some nationally and internationally significant shipwrecks that led to the development of the current Australian program and the proclamation of the *Historic Shipwrecks Act 1976*.

The implications of considering it in the context of this paper are to see how far the program has developed. A substantial amount has been written about the work of the Western Australian Maritime Museum and therefore it will not be greatly elaborated on. Suffice to say, the main features of the Western Australian Maritime Archaeology Program during the 1960s and 1970s were:

- Sole Australian program on shipwrecks (and associated maritime sites);
- Main activities were excavation, research, publications and exhibitions;
- Activities were largely centred on the four Dutch shipwrecks;
- Shipwreck surveys and excavations of colonial (post 1829) vessels commenced;
- A small number (*c.* 25) of shipwrecks protected under legislation;
- Initially State legislation used, which led to the Commonwealth *Historic Shipwrecks Act 1976*;
- Practitioners advised by a community Advisory Committee;
- Assisted by a group of volunteer divers.

The shipwrecks (maritime archaeology) program in 2000

- All the States and Commonwealth now implementing shipwreck programs comprising three museum

agencies and five Cultural Heritage Management (CHM) agencies;
- Contain 5 000+ shipwrecks protected under legislation;
- Have uniform Commonwealth objectives and guidelines;
- Combination of management and archaeological projects;
- Commonwealth and State Historic Shipwrecks Acts and Heritage Acts to protect sites within Australian territorial waters and waters within the limits of the States;
- National (AIMA) and state based community (voluntary) groups;
- Appropriately trained state practitioners, many through the Western Australian Post Graduate Diploma in Maritime Archaeology;
- Two universities teaching maritime archaeology subjects as part of undergraduate archaeology degrees.

Positive outputs / aspects of the historic shipwrecks program

- Commonwealth, State cooperative program and projects;
- They are government agency projects that conduct public projects (outputs for community) such as:
  * *Batavia* and HMS *Pandora* excavations and exhibitions;
  * Shipwreck interpretive trails, such as the Great Ocean Road Shipwreck Trail; (Victoria), and the eight South Australian shipwreck trails;
  * International travelling exhibition of the *Fides*, highlighting shipwrecks as an international resource;
- Compilation of National Historic Shipwrecks Research Plan;
- AIMA projects, such as the Database, AIMA/NAS training, scholarship;
- Publications;
- Academic research.

Negative outputs/aspects

- Public program—run out of only one agency per State, which highlights and encompasses:
  * Inconsistencies, lack of resources, conflicts;
- Bureaucratic 'ownership' of the program;
- Priorities for Minister (politically driven);
- Lack of community ownership of the program;
- New Commonwealth Heritage regime—not to include shipwrecks;
- Legislation—outdated, ineffective:
  * Operations in 2000 are inconsistent with the 1970s which is where the legislation has remained;
  * Sanctions selling artefacts (many obtained illegally);
  * No management provisions;
  * SS *Yongala* issue—users pay!

Thoughts for a future program

If this was a business and shipwrecks were the products to promote, manage, how would it be done?:

- Provide a service for clients—having made an assessment of their needs and expectations;
- Provide a service that would be financially sound—users pay, and assist groups with grants;
- Ensure staff was able and equipped to implement the work and meet expectations;
- Ensure that there was a feedback process;
- Provide performance indicators;
- Keep up with changing needs.

A focus for a future program

A National collaborative project that includes shipwrecks within the broader maritime heritage picture and that has as an outcome—an Australian Maritime Cultural Identity—which can be clearly seen and understood by the community.

- A National Project that encompasses all of Australia;
- Client focussed—community and politicians;
- Theme based structure, e.g. settlement and development of Australia—'peopling the continent'.

Project outline

All the Australian States, capital cities, regional centres were established through maritime industries, and much of this material culture still exists.

- Document this remaining maritime material culture to explain and tell the story;
- Focus on, and include:
  * Aboriginal relationships with the sea and rivers;
  * European explorers;
  * Settlement along the coast and on rivers;
  * Ships and shipwrecks;
  * Oral histories and traditions.

Project process and goal

Allocate tasks to groups:

- Determine roles for Universities / Museums / CHM agencies in research, surveys, excavations, education;
- Establish focal places within regional communities;
- Involve other agencies, such as National Parks;

- Involve community groups such as AIMA, regional historical groups; state based groups;
- Establish state focal places at state museums;
- Manage the project within state CHM agencies.

Project goal

National, state and regional focal places which could include exhibitions, publications and promote real and virtual tours of Australia's Maritime Cultural Identity.

Future activities required

- Develop partnerships—government and non-government, universities, community groups, and formulate and implement collaborative projects;
- Need a balance of activities—not just tourism, or archaeological, or management;
- Review and amend shipwrecks legislation and legislation affecting historic shipwrecks;
- Establish a fund or avenues for funding;
- Establish a National Maritime Heritage Council to promote the program with the Minister and the community, so it is not just bureaucrat driven;
- Appoint a Head of Council—a champion—for promoting the cause.

Appendix 2

Submitted to the Inquiry into the Commonwealth's heritage legislation

Shipwrecks and maritime heritage initiatives

This paper is presented by the Australian Institute for Maritime Archaeology (AIMA) and raises some implications of the Commonwealth's review of its heritage legislation on historic shipwrecks.

Background to AIMA

AIMA is an organisation dedicated to the promotion of maritime archaeology. Based in Australia it has sponsored work throughout Australia, Asia and the Pacific. Its objectives are to support and undertake research in the field of maritime archaeology within a defined Code of Ethics and to publish the results of this work. It publishes quarterly newsletters, an annual Bulletin and special reports, and offers an annual scholarship. It runs an annual conference, sometimes in conjunction with other groups, such as in 2000 with the Australasian Society for Historical Research on the theme of Archaeology, Heritage and Tourism, held in Adelaide in late November. AIMA employs on a part-time basis a National Training Officer to implement training courses on the research and management of shipwrecks and maritime heritage sites.

AIMA's membership comes from individuals and organisations that have an interest, and in some instances an involvement in the profession of maritime archaeology, maritime archaeological conservation and maritime history. It is not an exclusive group and boasts members from all sections of the community as well as the professional ranks, from around Australia and the world. AIMA is a voluntary organisation and it receives some support from the Commonwealth and State Governments in the work it implements.

AIMA is well known internationally through its involvement in projects and training courses in several countries as well as through its annual Bulletin and conferences. In about 1990, a past president of AIMA, Graeme Henderson (now Director of the Western Australian Maritime Museum) was appointed President of the ICOMOS International Committee on the Underwater Cultural Heritage.

AIMA's perspective and therefore its agenda on maritime archaeology are from both a community and professional point of view. It is primarily interested in seeing the ongoing preservation and research of Australia's maritime heritage, with shipwrecks being a significant part of this subject, although not the only aspect. It has, and will continue to lobby Australian State and Commonwealth Governments as well as other nation's governments and organisations on these issues.

Background on maritime heritage / shipwreck management in Australia

Legislation

The preservation and research of Australia's maritime heritage is largely controlled by State and Commonwealth governments, primarily through legislation and programs. The Commonwealth's *Historic Shipwrecks Act 1976* applies to shipwrecks lying in Australian territorial waters which includes waters adjacent to all the States and Territories, from the low water mark out to the edge of the continental shelf (200 nautical miles), but does not include waters within the limits of a State. For instance, in South Australia, the two gulfs—St Vincent and Spencer, are State waters, as well as some historic bays, and some other States have State waters. However, the vast majority of the waters around Australia are Australian territorial waters and therefore Commonwealth legislation is required to protect shipwrecks.

AIMA is concerned that the present review of the Commonwealth Heritage Legislation does not include the Historic Shipwrecks Legislation. This implies that shipwrecks are not part of Australia's heritage and AIMA is concerned that this will further marginalise shipwrecks as part of our heritage, particularly in the eyes of the Australian public and government agencies. AIMA believes that this could have a number of implications on the future management of shipwrecks, namely the resourcing of the Historic Shipwrecks Program. And yet it is AIMA's

understanding that the new heritage regime will include a list of places owned by the Australian government, and therefore manage them—which includes many shipwrecks!

AIMA is also unsure of the implications of the *Environment Protection and Biodiversity Conservation Act 1999* on historic shipwrecks as this Act relates to land under the control of the Australian Government and, as stated, many of Australia's shipwrecks are found in Australia's territorial waters.

The last review of the Commonwealth's *Historic Shipwrecks Act 1976* was in 1990 at which time some amendments were recommended, namely the establishment of a National Historic Shipwrecks Advisory Committee; inclusion of the selection criteria in the legislation; and a significant increase in the funding, but they were not acted upon.

A National Database of Australian shipwrecks encompasses over 6 500 shipwrecks. This number could easily be in excess of 10 000 through the results of current and future research. The number of shipwrecks sites protected under the legislation has gone from 153 in 1993 to over 5 000 at the present time. This came about from the proclamation in 1993 of a new section in the legislation (amended in 1985) to protect all shipwrecks over 75 years old. Before this, only shipwrecks that were specifically nominated were protected.

Currently, Australia has legislation which was proclaimed to apply to only a handful of shipwrecks and therefore contained complementary provisions, and after only being slightly modified, the legislation is being used 25 years later to apply to over 3 000% more.

In a recent development, it is unsure if the 75-year blanket protection provision applies to either ships that are 75 years old when wrecked, or ships wrecked at least 75 years ago, or both. This issue has implications on amongst other things, the number of shipwrecks protected and therefore the amount of resources to be spread around.

Most other state heritage legislation around Australia, including legislation applying to shipwrecks, has been constantly reviewed and upgraded.

Operations of the Commonwealth Historic Shipwrecks Program

The manner in which the program operates in Australia is that the Commonwealth Government agency, the Department of the Environment and Heritage, delegates much of the day to day management to State Government agencies which employ on average one to two permanent state funded employees. The Commonwealth provides funding to each State to implement 'Commonwealth activities/projects' on shipwrecks located in Australian territorial waters and this money is used to employ maritime archaeologists on a short and long term, temporary basis.

However there is a vast discrepancy between the level of Commonwealth funding and the number of Commonwealth shipwrecks, compared to what the States' fund and the number of shipwrecks covered by State legislation. For instance, the Commonwealth grant to South Australia during 2000/2001 was *c.* $5 000 and there are approximately 350 shipwrecks located in Australian territorial waters adjacent to South Australia. The State agency funds the maritime heritage program to the tune of *c.* $160 000 (in addition to supplying capital equipment) and there are about 450 shipwrecks located in waters within the limits of this state. In New South Wales the comparison is $56 700 funding from the Commonwealth; 1465 (86%) of its shipwrecks lying in Australian territorial waters; $217 000 funding from the State Government; 247 shipwrecks within the limits of the State.

The extent and nature of historic shipwreck sites funding to date for the national program has been far from adequate. To make matters worse, Commonwealth funding has been reducing significantly over the last 5–6 years both by virtue of not keeping up with inflation and secondly with a reduction in actual dollars.

The current state of annual funding for the Historic Shipwrecks Program around Australia is $330,000. This needs to be shared between the six states, the Northern Territory, Norfolk Island and any other external territories and AIMA to implement many of the functions required under the Commonwealth *Historic Shipwrecks Act 1976*.

To put this in context, the Commonwealth Historic Shipwrecks Program budget is less than 20% of the annual budget for Heritage SA to manage all its heritage programs in South Australia alone, where they protect and manage about 2 000 land-based sites and places, with a staff of 20.

The Commonwealth National Shipwrecks Program budget is slightly more than 20% of what the Commonwealth Government is considering to invest in the preservation of one vessel, the *City of Adelaide*, located in Scotland and where it is estimated that another $13.5 million is required to fully restore the vessel.

It is less than what is available in two rounds of the Commonwealth Government's Cultural Heritage Projects Program for South Australia alone.

General implications of not reviewing the shipwrecks legislation and program

The maritime heritage profession and the preservation of maritime heritage is not the same as other heritage interests. If we could compare the amount of the resources put into the general heritage field it would outweigh maritime heritage by an immense factor. Maritime archaeology—or shipwrecks, are only funded by governments as already discussed.

Two of Australia's universities—Flinders University in South Australia and James Cook University in Queensland—provide much-needed additional stimulus

in maritime archaeology as well as a number of very keen students to further the profession.

At the same time, recreational diving and both recreational and professional fishing have a considerable impact on historic shipwrecks. Much of this impact is due to a lack of awareness of the impact of their activities. With fishing activity, anchors and trawl nets often cause severe damage and dispersal of shipwrecks without the owner being aware of its presence in the first place. In other cases, fishing is being carried out illegally on historic shipwrecks intentionally but due to a lack of resources to monitor this activity, it continues undisturbed. This loss of the historic record will continue unless adequate levels of funding for survey, documentation and promotion of public awareness.

The potential to earn money on an ongoing basis from the effective management, research and interpretation is immense. One shipwreck alone, the SS *Yongala* wrecked on the Great Barrier Reef in 1911, earns the charter operators who takes the 10 000 divers annually to the site, in excess of $2 million. Under the present legislation and program the Commonwealth Government can not charge these operators one cent toward the management of this site.

Many of the 5 000 shipwrecks in Australia could be similar to the *Yongala* if the program was effective, and utilised up to date legislation. The diving industries around Australia are growth industries. In the 1980s it was estimated that there were 45 000 licensed scuba divers in Victoria alone. There were over one million registered dives on the Great Barrier Reef in Queensland in 1999. In New South Wales it is estimated that there are 70 000 trained scuba divers, and over 130 dive shops and clubs.

Local communities, businesses and councils consider that the shipwreck and maritime heritage trails provide a lasting economic legacy for regional communities, not just for the tourism operators. In some regions this economic benefit is a major boom for their region.

It is known that Australian marine tourism and recreation is worth $13.2b (domestic) and $2b (international) annually (Australian Bureau of Statistics).

Of course, the interpretation of shipwrecks and the other remains of our maritime heritage are not restricted to the in-situ interpretation, but also within the many maritime museums located around the country.

Eleven of Victoria's maritime museums and historic ships attract 244 000 visitors annually. The Western Australian Maritime Museum gets 200 000 visitors annually and its web site gets 17 000 visitors per month. New South Wales' major maritime related museums have over 650 000 visitors annually. Many of the main attractions at these museums are shipwrecks because of the fascination they hold for the general public.

When the Historic Shipwrecks Bill was debated in the Upper and Lower Houses of the Australian Parliament, Senator Whithers had the foresight to see that 'it [historic shipwrecks] will be part of our tourist attractions in the future', I wonder what he would say about our progress?

In AIMA's opinion, the current state of maritime heritage/shipwreck management in Australia is in a state of despair.

Recommendations

AIMA recommends that the *Historic Shipwrecks Act 1976* and the associated National Historic Shipwrecks Program be reviewed in context with the review of the Commonwealth's Heritage Regime and its other Heritage Legislation.

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