Iron, steel and steamship archaeology in Western Australia: SS *Xantho* after twenty years and other developments

M. McCarthy

Figure 1. Geoff Kimpton recording the SS *Xantho* engine (M. McCarthy).

Abstract

The successful reassembly of the SS *Xantho* engine on the exhibition floor at the Western Australian Museum's Shipwreck Galleries resulted in a number of celebrations. These included the June 2006 iron, steel and steamship archaeology progressive seminar which travelled from Fremantle to Melbourne and Sydney, and the opening of the Western Australian Museum's *Steamships to Suffragettes* exhibit. Shipwreck conservators also joined to examine developments in the field and to discuss the problems they had in dealing with the engine. This paper provides a background to the 2006 celebrations and outlines the breadth of the SS *Xantho* studies since the first Australian on-site practical and theoretical seminar on iron and steamship archaeology in 1985. It also examines other developments in iron, steel and steamship archaeology in Western Australia since that time.

Introduction

In November 1872 the SS *Xantho* abruptly slid beneath the waves—settling onto the historical scrap-heap and sending its controversial owner Charles Broadhurst into financial and social ruin. Both *Xantho* and Broadhurst then came to be dismissed as unworthy, ignominious failures and were soon forgotten. In the quarter of a century that has elapsed since the project began, the ship, its engine, the man and his extraordinary family came to be reassessed in detail, with surprising results. This occurred primarily because the material remains found at the wreck were at odds with both the engineering expectations and the known historical records (McCarthy, 1986a).

The location and identification of the site by the Maritime Archaeological Association of Western Australia (MAAWA) using Graeme Henderson's research, its inspection by Scott Sledge in 1979 and subsequent looting, led to the author leading a 1983 survey and test excavation. This included a pre-disturbance biological and electrochemical assessment of the wreck conducted by diving conservators Neil North and Ian MacLeod, assisted by visiting biologist C.J. Beegle. This regime of tests was commissioned on the author's understanding that iron and steamship wrecks were, in effect, a new class of archaeological site and that they needed to be examined, assessed and managed without any preconceptions. At *Xantho* the importance of diving conservators was firmly established and after much deliberation and partly as a result of their findings, a decision was made to recover the engine (McCarthy, 1986b).

Figure 2. Some of the deconcretion team. Here, Australia (I. MacLeod, R. Garcia and M. McCarthy), France (Paul Mardikian), Canada (Alexandra Elliot) and Brunei (Kolam Gaspar) are represented (Jon Carpenter).

Figure 3. Richard Garcia applies protective coatings to the engine in the *Xantho*/Broadhurst gallery (Jon Carpenter).

From the outset it was decided that, in attempting the recovery of an engine from a highly saline environment, we were planning something that had not been done before. As a result, we would document and promulgate both our successes and our mistakes such that others following might benefit (See also conservation seminar notes). It was also decided to invite others to participate in this learning process (Harvey, this volume). This led to the convening of a theoretical and practical seminar in iron and steamship archaeology held at the SS *Xantho* expedition and field laboratories at Port Gregory, Western Australia (McCarthy, 1986c). With delegates in attendance from all over Australia, practical and theoretical sessions were held and the stern was excavated. Then the ship's engine was raised (thanks mainly to Geoff Kimpton's underwater cutting and rigging skills). Considerable sponsorship and in-kind support were key factors in these successes, for the budget provided for the expedition, the lift, the transport south, the conservation tank and the seminar was AUS $7,200. It was not exceeded and the successes were such that, utilising funds subsequently provided by the Western Australian Museum, 46 papers emanating from that seminar were eventually published (McCarthy, 1988).

Since that time there have been over two decades and thousands upon thousands of hours of activity in the archives, in the laboratory and in the treatment tanks (Carpenter; Garcia; Godfrey; MacLeod; Mardikian; Prall; Richards, this volume). Between 1985 and 1995 archaeologists, conservators and scientists from across the globe assisted in the treatment and deconcretion of the engine.

In the deconcretion—effectively an excavation in its own right—and in the fieldwork at the wreck, *Xantho* unequivocally proved the validity of iron, steel and steamship studies. On a technical and historical level the *Xantho* engine was shown to be the only known example of the first mass-produced, high-revolution, high-pressure marine engines.Despite their unique status, few primary documents remain extant. The remains recovered from the seabed are still the major source of information on the type. The project also helped cross one of the last bridges between maritime archaeology and the mainstream when it addressed anthropological questions about the behaviour of the vessel's owners and operators (Veth & McCarthy, 1999; McCarthy, 2000). Well over a hundred refereed articles; a book; two theses—one a Masters in history, the other a Doctorate in maritime archaeology—a film, facilitated by Jeremy Green and jointly produced by Ray Sutcliffe formerly of the BBC and Ed Punchard's *Prospero Productions*; many news and television items, and websites; conference proceedings; and, five separate museum exhibitions have been the resulted from the project (McCarthy, 1990; 1996).

Conserved (under Neil North and then Ian MacLeod's guidance); disassembled (thanks largely to Dick Garcia's skill and commitment); re-conserved and then reassembled—in a process taking thousands of staff days and seemingly-endless effort—the engine can now be turned over by hand. This was the first successful conservation and reassembly (to near working order) of any engine from a saline environment (Garcia, Macleod, Richards & Burrow; Godfrey & Richards, this volume).

The Crimean war type ex-RN gunboat engine now lies intact in the public gallery where it was rebuilt alongside a working model of the engine. A product of model engineer, the late Bob Burgess' skill and generosity, it was built to steam engineer and steam historian, the late Noel Millar's engineering drawings of the deconcreted original (Burgess & McCarthy, 1994). This was the first model engine to be produced from maritime archaeological sources and it was developed for the same reasons that archaeological models are produced for wooden ships i.e. to ascertain how they performed in their contemporary

Figure 4 a & b. Engineer Noel Millar and model-maker Bob Burgess at work (M. McCarthy).

environment. The bill from the maker for his thousands of hours of labour—a copy is retained to this day— $49!

The Museum also received an impression of the stern produced by Maritime Archaeological Association of Western Australia President Joel Gilman (this volume). This was followed by a computer schematic of the engine in operation by maritime history curator Michael Gregg (this volume). These, along with the entire gallery infrastructure, equipment, facilities and expertise were all sourced gratis.

Having been originally built in the 1860s, complete with large wooden support columns topped with rolling gantries, the *Xantho* gallery—quite co-incidently—is an architectural mirror of John Penn's Greenwich workshop. In viewing a large photograph of the Penn works as it appears in contemporary depictions on the eve of his receiving the order to build the original gunboat engines, visitors to the gallery marvel at the similarities. They can also see and even touch—though we quietly, but not ostentatiously, discourage the practice—parts of what is consciously presented as a 'living' exhibit, the property of the people. Tools, hoists and cranes, grubby 'lab' coats and the other paraphernalia of a workshop, lie scattered throughout, consciously adding to the sense of 'being there' with the specialists. Archaeology and conservation staff often appear in the gallery, working and talking about the *Xantho*, its people, the engine, the conservation, disassembly and reassembly. Visitor Service Officers regularly give tours in what is now judged one of the Museum's best offerings, a counterpoint to the fabulous *Batavia* exhibit. As indicated, the *Xantho* exhibition is in its 5th iteration, with two of the earlier presentations having been designed by undergraduate students as part of their exhibition and design studies under TAFE lecturer Darrell Hick (C. Green, 2004). A former member of the Museum's exhibition and design team, Hick traces his lineage back to the former owners of the PS *Xantho* in Britain.

Unexpected elements emerged as the ship's owner Charles Broadhurst, his financial structures and entrepreneurial 'style' were of necessity examined in the light of the archaeological and technological anomalies evident at the wreck of his ship and in the excavation of its engine in the laboratory. Once considered odd and ill-conceived, a 'maritime lemon', our attitudes towards the SS *Xantho* changed over the course of the two decades in which the project was in full swing. Broadhurst's purchasing this little ship, a hybrid 'refugee from the scrapheap' (McCarthy, 1986b) eventually came to be seen as an inspired and creative reaction to the problems he encountered in operating a steamship on the remote

Figure 5. The Broadhurst family and their 'Malay' servant soon after *Xantho* arrived in Australian waters (Reproduced courtesy Broadhurst Family).

north-west Australian coast (McCarthy, 2000). In studying Broadhurst, his support structures and his motivations, we were also led to his wife, Eliza Broadhurst, who helped keep the family secure despite his continual financial failures. This research revealed her remarkable talent in many fields (e.g. education, drama, music, languages, mentoring) and her gravitation to the growing women's movement in the mid, tolate 19th century. This appears evident in her scrapbook, a copy of which appears on the exhibition floor for visitors to browse through. Attention also turned to their children. Their eldest son Florance Constantine Broadhurst eventually became a fabulously wealthy guano merchant, the catalyst for the first granting of monopolies in the Western Australian mining industries. His sister Catherine Elime Broadhurst was to become a suffragette, who chained herself to the London railings and was force-fed after being imprisoned for her stance on votes for women (McCarthy, 2000).

As a result of these rich avenues of study, graduate students in archaeology, history, conservation, museology, anthropology, art and architecture, Indigenous studies and women's studies joined us in the laboratories and in the galleries over the years. The most recent were Elizabeth Parrott (2001) and Amanda-Jane Arnold (Visitor Services Officer) (2003) who, with assistance from Susan Cox our Departmental Secretary, produced reports in social history that concentrated on the Broadhurst women. Their analyses now feature in the Museum's Steamships to Suffragettes exhibition alongside the engine and other more traditional shipwreck, engineering and maritime history fare. These and the original concept plan for the exhibit also appear on the Museum website <http: //www.museum.wa.gov.au/collections/maritime/march/shipwrecks/Xantho/Xantho.html>.

Another of the unexpected results, the study of Indigenous maritime depictions, became doubly of importance because the Broadhurst family appear not to have produced or kept any illustrations of one of their greatest failures, the ill-fated *Xantho*. Nor did other Europeans, presumably for the same reasons. In contrast, one group of Indigenous people, deeply affected in many ways by the little steamer, produced a number of rock engravings of it with smoke belching from its funnel.

Another depiction—appearing on the title page—appears to have been produced by one of the 200 'Malay' divers Broadhurst brought to Australia on *Xantho*. Many were abandoned at Geraldton and at Shark Bay in controversial circumstances and many stayed on in the Shark Bay pearling industry, intermarrying and forming the basis of the diverse population of Denham in Shark Bay. Around 1917, some 45 years after the loss of *Xantho*, one of these men, a former Shark Bay pearler named Sammy Malay (also known as Sammy Hassan) joined an Aboriginal group at a soak near Walga Rock inland from the mouth of the Murchison River. Soon after he arrived there a ship painting appeared in a nearby cave. This is one of Australia's best-known maritime depictions, and it is believed, with very good reason now (see the inside cover), that it is SS *Xantho* and not a Dutch East India ship as once thought (McCarthy, 2000). The existence of these images then led to graduate student Nicolas Bigourdan joining the project leader in the completion of an analysis of all the Indigenous watercraft depictions on the west coast.

Ostensibly far removed from the study of submerged industrial and historical archaeology, these are now some of the many threads woven into the rich *Xantho*/Broadhurst tapestry. Finally, as a result of the Museum's work, Charles Broadhurst has become recognised as 'the' original West Australian entrepreneur—an innovative and very controversial forerunner to Claude de Bernales in the goldfields, and their modern counterparts Robert Holmes à Court, Kerry Packer, Laurie Connell and Alan Bond. Again, a graduate student, (Museum Visitor Services Officer Daniel Gerson) was invited to join the *Xantho* team to progress these studies.

A pioneer pastoralist; steamship owner; an innovative pearler; the first to import 'Malays' to the industry; the first to utilise the 'hard hat' in the pearling industry; the first to introduce steam power to the industry; the most prominent pearler at Shark Bay in its formative years; fish canner; guano merchant; and, disgraced MLC, Broadhurst—despite the controversy in which he was forever embroiled—was recently recognised as one of Western Australia's 100 most influential people of all time.

It is not appropriate to re-visit these many studies in any detail; to list the vast *Xantho*-related publications list (from many authors); or to describe further the successes had in conserving the *Xantho* engine. Much of this appears in these papers. It is useful, however, on the occasion of the 2006 celebrations to re-visit the first *Xantho* celebrations of a century and a half earlier. Here are some selections from the *Xantho* poem and some of the 17-verse song, penned on the occasion of its arrival as a paddle steamer at Anstruther, Scotland, in 1848, to a dinner, a ball and other celebratory activities. They were re-discovered in the local archives only a few years ago by Paula Martin, a resident of the area and Editor of the *International Journal of Nautical Archaeology* in which

Figure 6. Image of SS *Xantho* at Inthanoona, Western Australia. Produced with permission of the Ngarluma Community (Alistair Paterson).

news of *Xantho* has regularly appeared. Unashamed doggerel it is, and as Paula Martin aptly noted 'perhaps it is no bad thing that I don't have the other 14 verses'. Nonetheless, of their very nature, the poem, the news article and song encapsulate the feelings about *Xantho* in 1848 and again over one hundred and fifty years later in 2006. The extracts are from *The Pittenweem Register* a journal bringing news of home to Scots across the globe.

POEM ON THE NEW STEAMER.
Verse 4
And there now lies into Leith Docks
A steamer very swift;
She is well made, and strongly built,
Which is a splendid gift.

Verse 6
Her value is three thousand pounds,
All ready for the sea;
O, then, I beg you'll buy a share,
And make your money free.

SONG ON THE NEW STEAMER *Xantho*

The song on the new steamer *Xantho* is all the rage in the East of Fife at present. It is composed by an East of Fife Poet, who is thoroughly acquainted with the history of his native place; and the song, which extends to 17 verses, gives a historical introduction to the coming of the *Xantho*, which cannot fail to be very acceptable to all who belong to this district. It finds its way through the world in the same manner as the register; hundreds of it have already reached their destination in various parts of Scotland where East of Fife people reside; and numerous letters with the *Xantho* Steamer Song in them are at this moment on their way to America, the East and West Indies, Australia, etc., and all who get it will be proud of the care and attention which their friends at home have bestowed on them… To those who have not as yet seen the song of *Xantho*, we take the liberty of laying the following three [we will present only two] verses before them, which is a fair specimen of the rest of the song: -

Hurrah! here she comes at twa in the morn,
Her great gun she fir'd, an' sound o' her horn
Did wake Anster fo'k, tho' loud they did snore,
Some started frae cozie beds—ran to the Shore
Blaw the trumpet o'er Fife, baith far and near;
The *Xantho*'s arriv'd at Anster west pier;
Tell a' the merchants she's ready to ply, -
Instead of sailing she almost will fly.
(Pitenweem Register, 1848)

Other Developments in Western Australia since 1985

Since AIMA's first practical and theoretical seminar on Iron and Steamship Archaeology at the *Xantho* site, there have been a number of significant developments in iron, steel and steamship archaeology in Western Australia. Many of these are covered in papers presented to the 2006 seminar e.g. the search for HMAS *Sydney* and the HSK *Kormoran*, (Finding *Sydney* Foundation, this volume); the excavation of the iron barque *Sepia* (Souter, this volume); the search for the SS *Koombana* (Thom, this volume); the location and identification of the wrecks in the Rottnest Island Graveyard (Green, this volume) and, the contribution of the MAAWA to the recording of large shipwrecks (Cockram, this volume).

Not mentioned in those papers is the Museum's role since the early 1980s in leading the drive to locate HMAS *Sydney* II (1941) and to tell the story of its loss to the satisfaction of the nation and the bereaved relatives. The Museum's role was acknowledged by Commissioner Terrence Cole when he opened the Inquiry into its loss just prior to these papers going to press. The 1991 Finding HMAS *Sydney* Seminar is but one manifestation of that earlier work (McCarthy & Kirsner, 1991). Another important development in this field was the inspection of the submarine IJN *I124* off Darwin out of RV *Flamingo Bay* and the drive to establish the submarine wreck as a bona fide archaeological site (McCarthy, 1990; 1991; 1998a).

In this period, the Department of Maritime Archaeology also assisted South Coast Divers, the SAS, salvage operator John Clarke and Busselton interests with the sinking of redundant steel vessels as dive sites e.g. the Whaler *Cheynes 3*, barges and a former warship HMAS *Swan*. This function was discontinued once local dive shops and tourist organizations realised the benefits and forged ahead with their own programs, rendering

Figure 7. The midships section of the SS *Colac* (M.McCarthy) .

the Museum's efforts unnecessary (McCarthy & Garratt, 1998b: 129). For a while the chief editor also sat on the Commonwealth's scuttlings committee advising on ship dumping across the nation, taking a facilitatory stance and encouraging the practice as a service to divers where environmentally sustainable. Though the Museum is no longer involved, a link with deliberately scuttled hulks is still kept via conservation scientists Ian MacLeod and Vicki Richards, conservators Jon Carpenter and Dick Garcia who monitor each and who utilise them as comparative studies (MacLeod, *et al.*, 2004).

Iron, steel and steamship wrecks also feature on the Museum's wreck trails. These were produced with government, business and private assistance, including that received from former post-graduate diploma graduate and filmmaker Ed Punchard's *Prospero Productions*. They also feature in the associated literature produced with assistance from maritime archaeologist Dena Garratt and high school students from across the state. To date there have been 17 wreck access pamphlets produced, including one catering for people with disabilities. Six wreck maps were also produced (McCarthy & Garratt, 1998b). Further, the iron barque *Omeo,* once a steamship, then an abandoned hulk, is set to become the State's premier wreck access facility alongside the Rottnest Island wrecks. Ian Warne from the MAAWA has produced a booklet on its history together with details of its being abandoned and of its collapse on the doorstep of a new residential marine complex at Port Coogee, south of Fremantle. Rockingham Senior High School students, led by outdoor education specialist Graham Lauritsen are producing maps and pamphlets featuring it and other wrecks of the region. Utilising these materials, the ship's anchors which were raised from the site, underwater markers and other interpretive materials, the Museum has plans to present *Omeo* for snorkellers of all ages, including those with disabilities, as an historic nature reserve and recreational asset. The taking of fish and other marine life will be prohibited for conservation purposes and in order to enhance the visitor experience.

A number of individual site inspections of importance to our field were also produced in this period, including the inspection of the SS *Pericles* off Cape Leeuwin, the composite barque *Phaeton* in the Cocos Islands and a number of WWII sites off Christmas Island.

Iron ships also feature in the Australian Contact Shipwrecks Program a program completed by Lesley Silvester while she was on internship with the chief editor (McCarthy & Silvester, 2000). The SS *Sunbeam* (1892), for example, is now part of the Gamberre people's legend after it was sunk by the snake spirit called in response to grievances with the crew. It was the second steamship to be involved in the north-west pearling industry, albeit a full two decades after *Xantho*. Details are available on the Museum's website. The Museum's 'Strangers on the Shore' database and website were developed by Lesley Silvester, her husband Michael Murray and staff member

Bob Richards. On completion, the program was expanded to include all known instances of contact in the eastern states <http: //www.museum.wa.gov.au/collections/databases/maritime/Strangers/strange.asp>.

Being also well-known folk musicians and composers, Silvester and Murray presented a musical play on the 'Strangers on the Shore' theme and they produced a CD featuring their songs'.

Staff have also travelled interstate and overseas since 1985, notably to Victoria, South Australia, Rabaul, Truk (Chuuk) lagoon, Turkey and Panama to assist with iron, steel and steamship wrecks and management programs there. Much of this appears mentioned in a compendium of projects, programs and publications produced by the Department (Green, Gainsford & Stanbury, 2004).

Closing this section is the iron SS *Colac* (1910) that was inspected just south of the Derby Wharf in 1995. It is one of the most intact of all our sites and ironically, because it lies in State Waters, it cannot be protected until the 1973 *Maritime Archaeology Act* with its 1900 cut-off date is upgraded to mirror Commonwealth legislation. This will be a vital step forward in our field as the majority of large wrecks now approaching 75 years old are of steel. All the more remarkable is the state of this particular wreck in such an extreme tidal flow, it being regularly completely covered by the tides, only to be then be exposed for hours as the tide recedes (McCarthy, 1996). The contrast between its remains and those of the former Liberty ship *Alkimos* (1963), where today only the engine and boiler remain visible above the surface, are stark indeed.

References

Arnold, A-J., 2003, A study of Eliza Broadhurst's personal scrapbook entitled 'Literary Cuttings from all Sources' . Report—Department of Maritime Archaeology, Western Australian Maritime Museum, No. 171

Bigourdan, N., & McCarthy, M., (in press). Aboriginal watercraft depictions in Australia: on land and underwater? *Bulletin of the Australasian Institute for Maritime Archaeology*, **31**: 1–10.

Burgess, R., & McCarthy, M., 1994, SS *Xantho* engine recovered and modelled, in *Model Engineer*, June 1994, (Argus Specialist Publications, Hemel Hempstead, 1994): 676–679.

Green, Caroline, 2004, *Xantho Gallery: 2004 Re-evaluation.* Report—Department of Maritime Archaeology, Western Australian Maritime Museum, No. 169.

Green, J., Gainsford & M. Stanbury, M., (Eds.) 2004. *Department of Maritime Archaeology, Western Australian Maritime Museum: a compendium of projects, programs and publications.* Australian National Centre of Excellence for Maritime Archaeology. Special Publication No. 9.

MacLeod I., Morrison P., Richards V & West N. 2004, 'Corrosion monitoring and the environmental impact of decommissioned naval vessels as artificial reefs', *Metal 04: Proceedings of the International Conference on Metals Conservation, Canberra, 4–8 October 2004*, eds J. Ashton & D. Hallam, National Museum of Australia, pp. 53–74.

McCarthy, M., 1986a, SS *Xantho*: a 19th Century lemon turned sweet. *Proceedings of the 16th Conference on Underwater Archaeology*: 54–59. Society for Historical Archaeology Special Publication No.4.

McCarthy, M., 1986b, Conservators underwater, maritime archaeologists above. *ICCM Conference Towards 200* , Perth 1985: 21–26.

McCarthy, M., 1986c, The excavation and raising of the SS *Xantho* engine and Australia's first practical and theoretical seminar on iron and steamship archaeology. *International Journal of Nautical Archaeology*, News, **15**(2): 173–176.

McCarthy, M., 1990, *Charles Edward Broadhurst, 1826–1905, A Remarkable 19th Century Failure,* Unpublished, M. Phil. Thesis, Murdoch University.

McCarthy, M., 1990, *HIJMS Submarine I 124.* Report Department of Maritime Archaeology. Western Australian Maritime Museum, No 43. Also in *The Flamingo Bay Voyage.* Report-Department of Maritime Archaeology Western Australian Museum, No 4.

McCarthy, M. & Kirsner, K. (eds.) 1991 *Papers from the HMAS* Sydney *Forum. Fremantle 21–23 November 1991.* Report—Department of Maritime Archaeology. Western Australian Maritime Museum No. 52

McCarthy, M., 1996a, SS *Xantho: towards a new perspective. An integrated approach to the maritime archaeology and conservation of an iron steamship wreck.* Unpublished Ph.D Thesis, James Cook University, Townsville.

McCarthy, M., 1996b. Wreck inspection report, SS *Colac* (1886–1910). Report—Department of Maritime Archaeology. Western Australian Maritime Museum, No. 110.

McCarthy, M. (1998a) The submarine as a class of archaeological site. *Bulletin of the Australian Institute for Maritime Archaeology*, **22**: 61–70.

McCarthy, M., & Garratt, D. (1998b) The Western Australian Maritime Museum Wreck Access and Outreach Program. *Bulletin of the Australian Institute for Maritime Archaeology*, **22**: 127–132.

McCarthy, M., & Silvester, L., 2000, The Australian contact Shipwrecks program. A report on the completion of the first stage in Western Australia. *Bulletin of the Australian Institute for Maritime Archaeology*, **24**: 133–5.

McCarthy, M., 2000, *Iron and steamship archaeology: success and failure on the* SS Xantho. Kluwer Academic/Plenum Publishers, NY.

McCarthy, M., 2007, Sammy Well. In Green, J., (ed.) *Report on the 2006 Western Australian Museum, Department of Maritime Archaeology, Cape Inscription National Heritage Listing Archaeological Survey.* Report—Department of Maritime Archaeology Western Australian Museum, No. 223 Special Publication No. 10, Australian National Centre of Excellence for Maritime Archaeology: 195–202.

Parrott, E., 2001, *A study of the life of Eliza Broadhurst 1839–1899 and her interest in the Women's Movement of Western Australia.* Report—Department of Maritime Archaeology, Western Australian Maritime Museum, No. 161.

Veth, P., & McCarthy, M., 1999, Types of explanation in maritime archaeology: the case of the SS *Xantho. Australian Archaeology*, **48**: 12–15