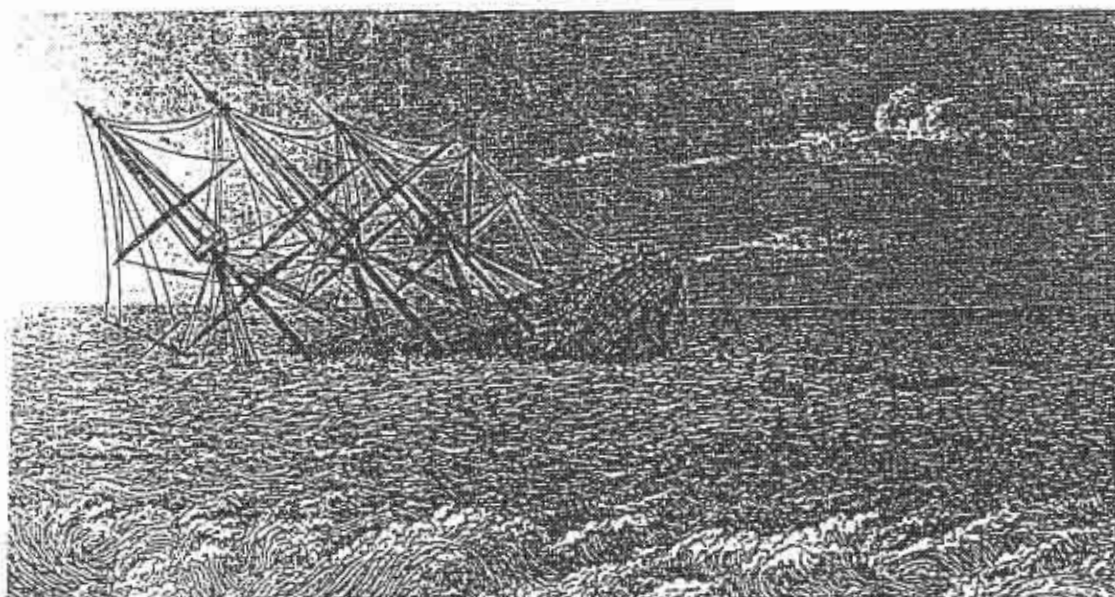


**Report on the Queensland Museum
1998 HMS *Pandora* Expedition
12 January to 28 February 1998.**



by
Dena Garratt and Geoff Kimpton

Report - Department of Maritime Archaeology
Western Australian Maritime Museum, No. 139.

Contents

Acknowledgment.....	i
Executive Summary.....	ii
Abbreviations.....	iii
Introduction.....	1
Description of the site.....	1
Expedition objectives.....	1
Mooring system.....	1
Excavation methodology.....	2
On-site conservation.....	4
<i>Pandora</i> site plan showing areas excavated.....	3
Achievements.....	6
Problems.....	7
Conclusions.....	7
The future.....	7

Figures

Figure 1. <i>Pacific Conquest</i> 's 5-point mooring system over the wreck site.....	2
Figure 2. <i>Pandora</i> site plan showing area excavated in the bow and stern.....	3
Figure 3. Conservation/photo lab on the upper deck of <i>Pacific Conquest</i>	4
Figure 4. ITT Flyte semi-submersible 3-phase electric pump for water dredge.....	5
Figure 5. Liquid oxygen tank and regulator for in-water O ₂ decompression.....	5
Figure 6. Recompression chamber on <i>Pacific Conquest</i>	8
Figure 7. <i>Undersea Explorer</i>	8

Appendices

1. Schedule of events.....	9
2. Personnel.....	10
3. Technical data.....	11
4. News paper article, <i>The Sunday Morning Herald</i> ,.....	12

Acknowledgments

Sponsorship of the Queensland Museum's 1998 expedition to the *Pandora* wreck site was organised by the Pandora Foundation. The main sponsor this year was the North Queensland Electricity Board, (NORQEB). Further funds were obtained from grants from the Centre of Excellence in Maritime Archaeology and the Commonwealth Historic Shipwrecks Program.

Executive Summary

Archaeologists, conservators, diving supervisors and volunteers from all Australian States and the United Kingdom joined Project Leader, Peter Gesner and his staff from the Queensland Museum for a seven week expedition to the *Pandora* wreck site in the Coral Sea.

For the first time, two diving teams worked simultaneously. One team continued the excavation of the stern area while another team initiated an excavation of the area near the ship's oven which is situated towards the bow.

Over 600 artefacts were recovered, including a 6-pounder cannon.

A new page on the *Pandora* web site called the Expedition Leader's Chronicle was set up, giving daily progress reports on the excavation.

This year the site was visited by the Torres Strait water police who paid a courtesy call from their base at Thursday Island. Executive staff from the major sponsor organisation, the North Queensland Electricity Board, enjoyed the opportunity to see at first hand how the project was progressing. they were accompanied by a journalist from *The Australian* newspaper.

A number of small artefacts were selected for a temporary display at the Museum of Tropical Queensland.

Abbreviations

ANMM	Australian National Maritime Museum
AS 2299	Australian Standards (Commercial Diving Operations)
DCIEM	Defence and Civil Institute of Environmental Medicine
JCU	James Cook University
MTQ	Museum of Tropical Queensland
NORQEB	North Queensland Electricity Board
QM	Queensland Museum
SCUBA	Self Contained Breathing Apparatus
SSBA	Surface Supply Breathing Apparatus
WAMM	Western Australian Maritime Museum

Introduction

In 1790, the British 24-gun frigate HMS *Pandora* was sent to the South Pacific to search for the mutineers from the HMS *Bounty* and return them to England to face disciplinary action.

Fourteen crewmen were captured at Tahiti and incarcerated in a wooden cage on the poop deck. This makeshift prison was inevitably called "Pandora's Box."

The *Pandora* was wrecked on 29 August 1791, approximately 130 kilometres east of Cape York, while attempting to navigate a passage through the Great Barrier Reef to Torres Strait. Four prisoners and 31 crew were lost.

The wreck was discovered in 1977 and since 1982, the site has been partially excavated by the Queensland Museum under the Commonwealth Historic Shipwrecks Program.

The excavations to date have shown that a substantial section of the hull and a large assemblage of artefacts remain in an excellent state of preservation.

Description of the site

The *Pandora* wreck lies on a gently sloping seabed at a depth of 30-33 metres, surrounded on three sides by reef. The area is prone to strong and unpredictable tidal currents of up to three knots. Due to the nature of the seabed sediments and the force of the tidal race, the wreck site is subject to significant sediment mobility, on a daily and a seasonal basis.

Expedition objectives

1. Upgrade the mooring system.
2. Continue the excavation in the stern and raise one of the twenty 6-pounder guns the vessel carried.
4. Excavate an area in the vicinity of the foremast and ship's oven with the view to:
 - a). locate the outer edge of the hull
 - b). shed light on the lives of the ordinary seamen by recovering the remains of their tools and personal possessions
 - c). shed light on the lives of the ship specialists (eg. carpenter, sailmaker, cooper, bosun) by recovering the remains of their tools and personal possessions.
5. Deploy a current metre on the site for the duration of the expedition.
6. Record *in situ* corrosion potential measurements of exposed metal objects on the wreck site.

Mooring system

Before excavations could commence, the four permanent moorings that were placed in position in 1996 were relocated and a fifth 3-tonne mooring block and anchor were deployed to augment the mooring system. Strong mooring lines were then attached to hold the vessel, *Pacific Conquest* over the wreck site. This task was achieved by diving teams using SCUBA equipment in unfavourable weather conditions on most days.

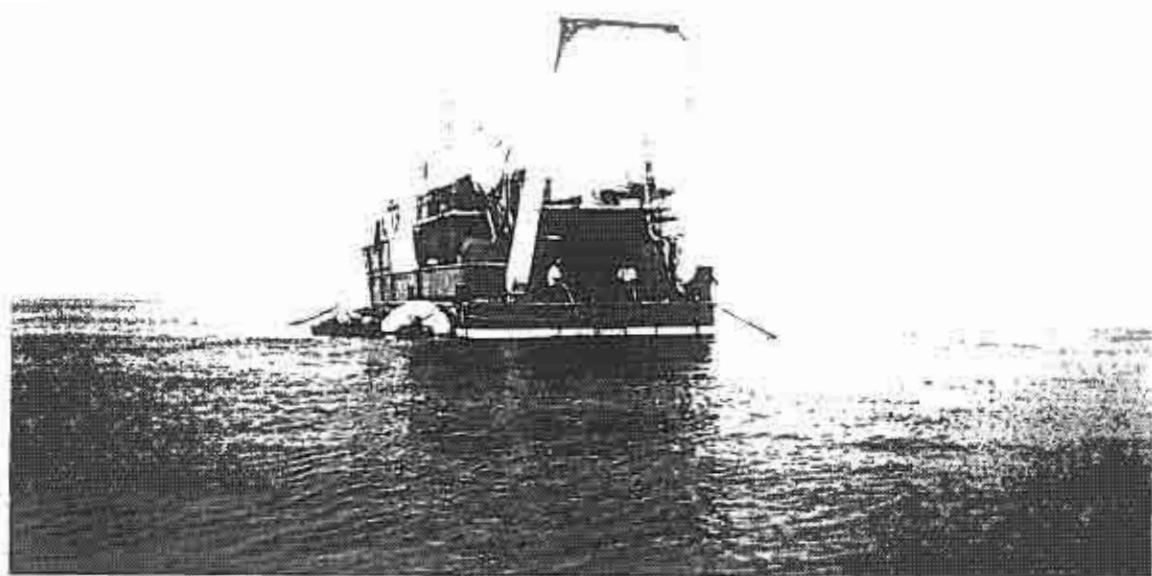


Figure 1. *Pacific Conquest's 5-point mooring system over the wreck site.*

Excavation methodology

Two SSBA diving stations were set up, one on the port and the other on the starboard side of the vessel. The vessel was positioned over the wreck site in such a way that the port-side team could continue with the excavation of the stern area while the starboard team could begin the excavation in the bow area of the wreck. Two water dredges were set up. A new semi-submersible electric water pump was trialed for the stern team's water dredge.

The foci of the excavations were at 16 to 18 metres along the baseline in grids 89,90 in the stern and between 34 and 38 metres along the baseline in grids 162,164,166, 181, 183, 185.

Measurements were taken from permanent datum points to establish the positions of the grid poles.

Hand fanning and water dredges were used to expose the hull structure and artefacts. The position of the hull structure and the artefact within the grids was plotted in three dimensions by trilateration, using three measuring tapes attached to survey points. These measurements were then recorded on underwater data sheets. Artefacts were tagged with a field number prior to removal from the site. The information from the data sheets was transcribed to a computer program that converts the slope distances to Universal Grid Coordinates.

Most artefacts were photographed *in situ* before being recovered and photographed again after registration.

Underwater excavation work was videotaped and reviewed by all participants at the end of each days diving operations.

At the completion of the excavation, the exposed area was back-filled with sterile sand from the spoil heap and covered with shade cloth which was then weighted down with sand bags and a further layer of sand covered the sand bags.

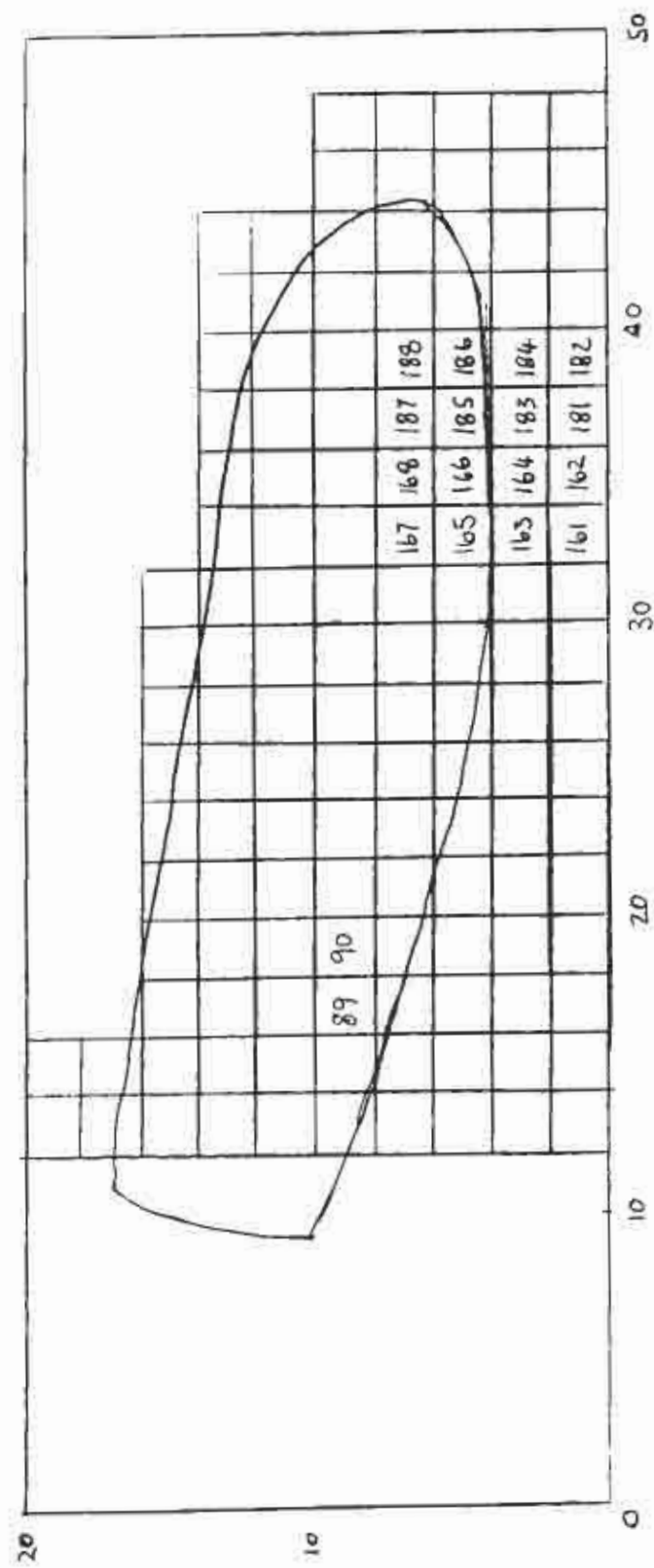


Figure 2. *Pandora* site plan showing area excavated in the bow and stern. Jan- Feb 1998.

On-site conservation

An air conditioned transportable cabin mounted on the demountable upper deck served as the on-site conservation and photography laboratory. Each artefact was examined, sketched and registered on a database (MS ACCESS) which includes a digital image. Artefacts were then placed in appropriate temporary storage containers and secured for the voyage back to Townsville.



Figure 3. Conservation/photo lab on the upper deck of *Pacific Conquest*. Artefacts are examined, sketched and registered on the table to the right as soon as they are brought to the surface.

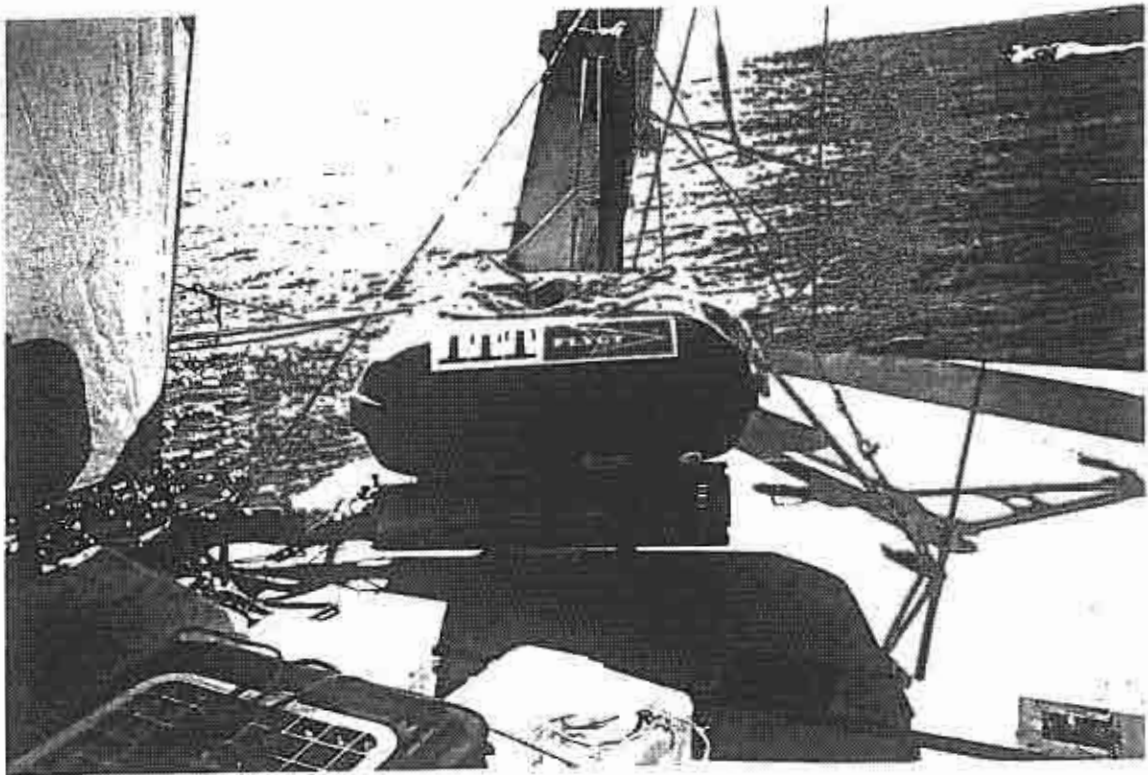


Figure 4. ITT Flyte Semi-submersible 3-phase electric pump for water dredge.

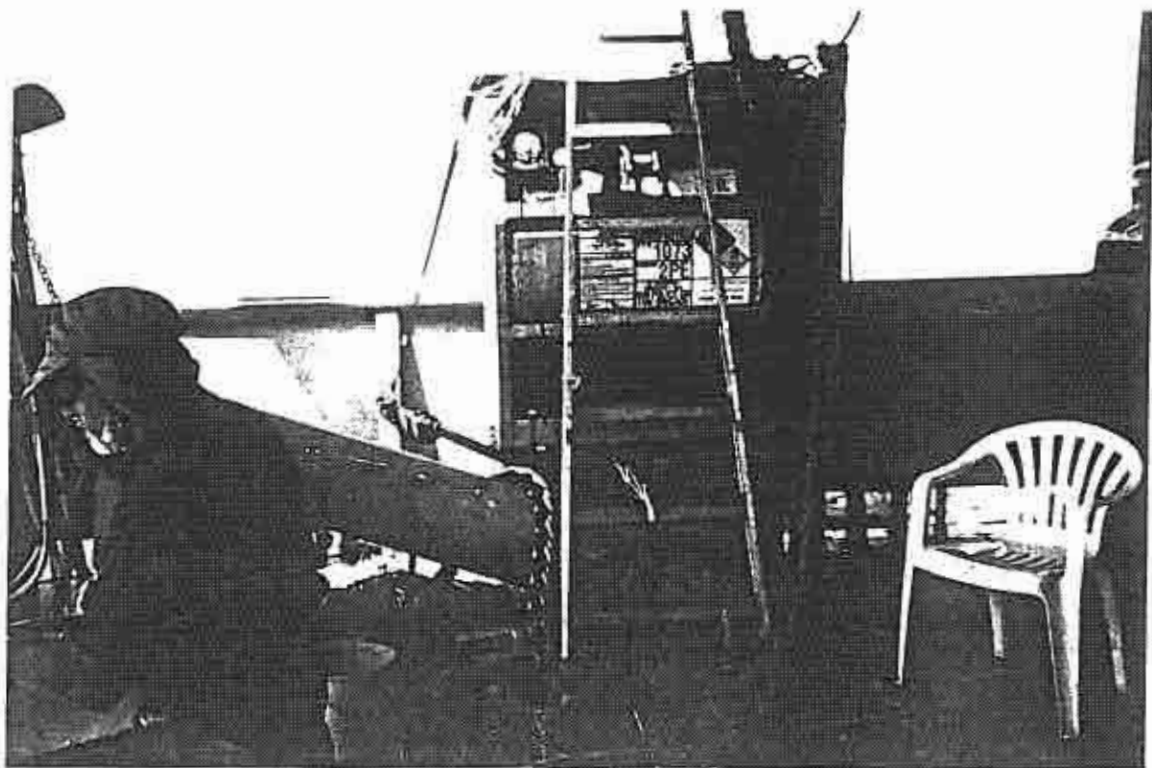


Figure 5. Liquid oxygen tank and regulator for in-water O₂ decompression.

Achievements

1. Excavation in the stern area.

This years excavation of the stern was a continuation of the work conducted in 1996-7 in the area of First Lieutenant Lakins' cabin. The powder magazine, the Captain's store and the sailing masters' cabin provided some remarkable finds. A high concentration of artefacts were recovered from this area, toiletry items, personal items such as intaglios, cutlery, crockery and navigational instruments, ethnographic material of Polynesian origin included shell fishing lures, poi pounders, and shell ornaments, ship's fittings, and a gun. The gun lay on top of the powder magazine, one deck below the officer's cabins. Two items of particular interest were recovered from the master's (George Passmore) cabin: an azimuth-sighting telescope (which may be part of the compass that was found concreted to the cannon), and a coin minted in Brazil in 1715.

2. Excavation in the vicinity of the ship's oven in the bow area.

The artefacts recovered from the bow excavation reflected their proximity to the ship's oven and the circumstances of the men in the fo'cle. Several large cooking cauldrons, the handle of a spoon, a large jug and smaller pots and jars were found among fragments of coal, ale and gin bottles and butchered animal bones. A large piece of leather hide (in good condition) and the staves of a large barrel were also raised. Ship's rigging such as pulley blocks and mast or spar hoops were uncovered and a thick hank of rope was found under the barrel staves. Personal items such as a small buckle, a button and the heel of a shoe were found. Surprisingly, a cache "artificial curiosities" was also found here which disproves the theory that only the officers were permitted to collect such items. Coconuts, pearl shells, fishing lures and war clubs were recovered from a small area near the oven. Two human bones were also recovered, one identified as a metacarpal (a thumb bone from an adult male).

3. Recording of hull structure.

Excavation of the area in the bow (shown on the site plan in Figure 1), revealed the ring of a large anchor, probably the best bower lying outside the hull.

Excavation of the outer planking and copper sheathing of the starboard hull structure confirmed the position of the outer edge of the hull and the orientation of wreck.

The structural remains indicate that the bow is canted over to starboard with the lower and platform decks collapsed onto the outer hull.

Large timbers running athwartships and large knees from the lower deck were exposed and measurements of the copper fastenings recorded. (Length 87cm, circumference 9cm. Records indicate that the *Pandora* had 30 such bolts for the hanging knees).

Dunnage timbers were identified and extensive remains of lead channelling, measuring 14cm x 19cm and 2 metres in length. This may possibly be liner for waterways. Lead sheeting was also found near the oven.

4. Recovery of a gun.

A small 6-pounder was successfully raised from the stern area.

The expeditions major sponsor, NORQEB, will provide a treatment tank and technical staff to monitor the desalination process.

5. Consolidation of the permanent mooring system with the placement of an additional 3-tonne concrete mooring blocks and anchors.

6. Launch of the *Pandora* world wide web site. The Expedition Leader's Chronicle

7. Successful trial of new equipment such as a semi-submersible three-phase electric water pump and the use of liquid oxygen for breathing gas.

Problems

Some down time was experienced as unseasonable weather necessitated the re-portioning of the *Pacific Conquest* so the vessel faced into the prevailing wind, however only one working day was lost due to rough weather.

Three divers suffered decompression illness (DCI) with a further two divers being treated for DCI with inconclusive results. Diving schedules and practices will require re-appraisal to alleviate this problem on future expeditions.

Communication between the two diving teams was hampered by the fact that the vessels could not be moored side by side. This necessitated considerable time and effort spent commuting from one vessel to the other in often boisterous sea conditions.

Conclusions

A particularly successful aspect of this years expedition has been the increased level of community participation via the web site.

Sponsor participation has proved equally successful and has provided an avenue for continued **long-term** sponsorship of the Project.

The excavation in the bow area is providing a clearer picture of the wrecking process and the state of preservation of the hull.

From the WA Maritime Museum's perspective, it is advantageous to keep SSBA certified staff up to date with diving skills. It is **also** an opportunity for staff to appraise new equipment and techniques in the field, with a view to introducing the most successful of them to the WA Maritime Museum. Of particular interest is the advantages of using ARGAS band masks with a through-water communication system. This particular communication system can be also be used with hookah or SCUBA apparatus.

The future

The personal involvement of sponsor organisation's senior staff proved a great success and will be **continued** on future expeditions.

Staff from the Centre of Excellence will be participating in the next *Pandora* expedition, scheduled for January 1999.

The Centre intends to conduct deep water tests of two recently developed mapping techniques; HPASS (sonar position fixing system) and a new digital photogrammetry system.

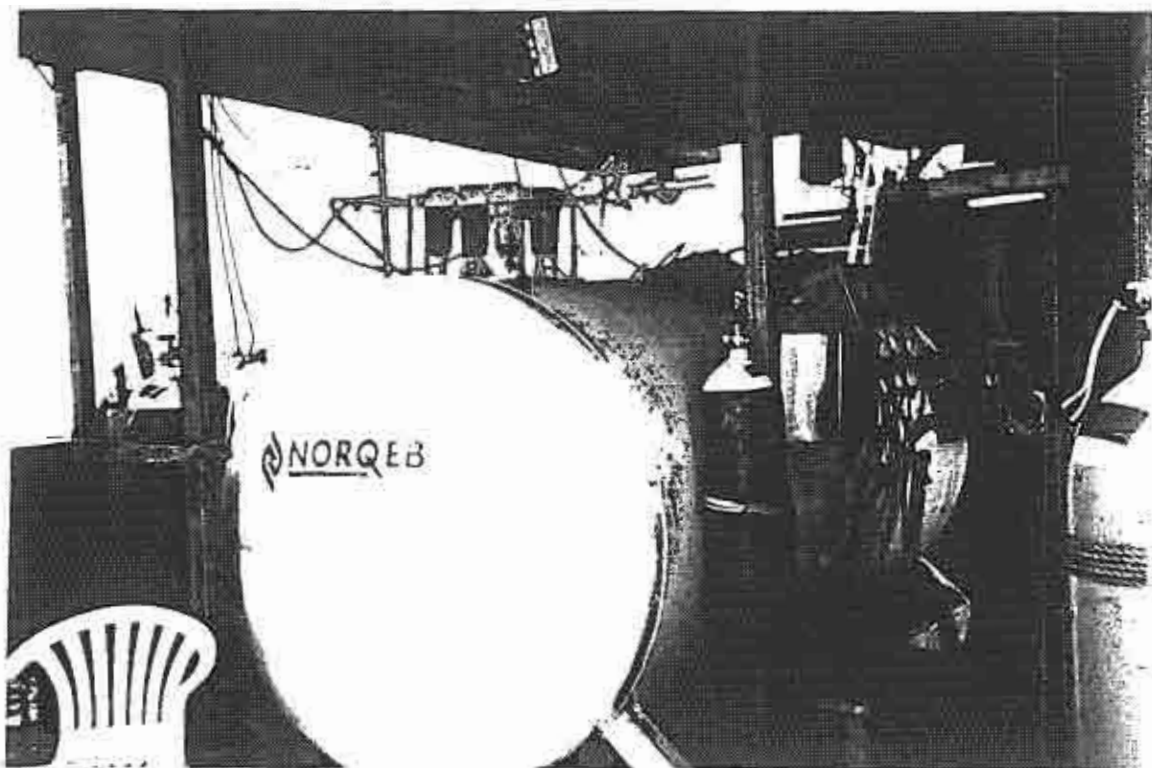


Figure 6. Recompression chamber on *Pacific Conquest*.

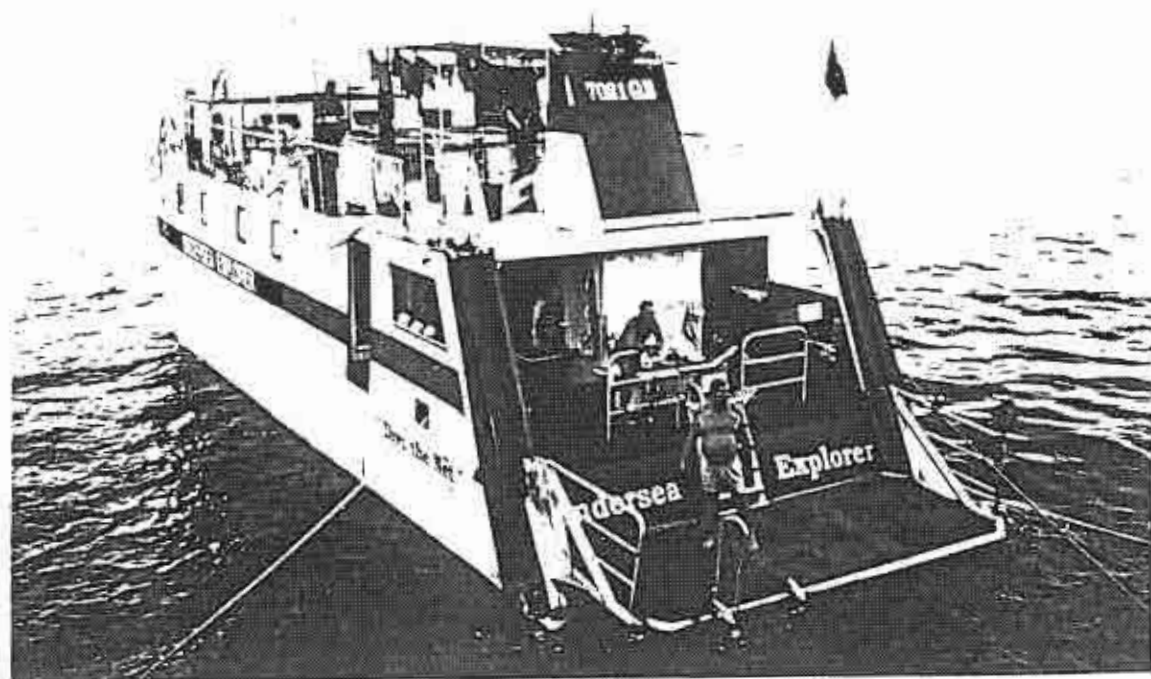


Figure 7. *Undersea Explorer*

APPENDIX 1

Schedule of events

The expedition was divided into two periods.

1st period - 12 to 27 January (TSMV *Pacific Conquest* only)

2nd period - 1 -23 February 1998 (*Pacific Conquest* and TSMV *Undersea Explorer*)

Both vessels due to rendezvous at the wreck site at approximately noon on 1st February and return from the wreck site on 23 Feb to arrive back in Townsville on 26 February.

There was a change-over period between 28 and 31 January at Thursday Island.

Geoff Kimpton participated for the 1st and 2nd periods. Dena Garratt participated for the 2nd period.

Undersea Explorer made three unscheduled stops on the return journey, the first at Lockhart River settlement to rendezvous with a Flying Doctor aircraft to transport a patient with decompression illness and another at Cooktown for refuelling. With time running out to reach Townsville for the official welcome at the dock, team members were off-loaded at Cairns and transported by minibus to Townsville.

26 Feb - The sponsor's reception at the Museum of Tropical Queensland (MTQ).

27 Feb - Open Day on the *Pacific Conquest*.

27 Feb to 8 March - Temporary exhibition of Pandora artefacts at MTQ.

APPENDIX 2

Personnel

Peter Gesner Expedition leader
Warren Delaney 2 IC/senior technical officer

Medical Officers

David Griffiths
Stewart Lavender
Alison Mann Hyperbaric nurse

Conservators

David Hallam
Jessica Turner
Freya Bruce
Sue Bassett

Photographers

Gary Cranich
Len Zell
Brian Richards

Diving supervisors

John Reed Chief diving supervisor
Howard Smith
Peter Illich
Murray Yates
Dennis LeSye

Assisting archaeologists

Vivian Moran (QM)
Terry Arnott (SA)
Bill Jeffery (SA)
Nigel Erskine (JCU)
Coleman Doyle (JCU)
Keiran Hostey (ANMM)
Mike Nash (TAS)
Cos Coroneos (NSW)
Ross Anderson (VIC)
Geoff Kimpton (WAMM)
Dena Garratt (WAMM)
Annabell Wood (UK)
Mark Lawrence (UK)
David Nutley (NSW)
Stirling Smith

Volunteers

Ian Lawrence
David Bell
Colin Ward
David Wood
Maurie Vierow

APPENDIX 3

Technical Data

Charter vessels:	TSMV <i>Pacific Conquest</i> and TSMV <i>Undersea Explorer</i>
Diving equipment: SSBA	ARGA Divator Mk III band masks Double lock recompression chamber equipped for mixed gas treatment schedules. Bench seat at 9 metre decompression stop.
SCUBA	Tank capacity 88 cu ft.
SSBA diving regime:	In accordance with AS 2299 requirements. Dive tables - DCIEM Max. working depth - 33 metres Max. bottom time - 45 minutes Decompression - 27 minutes at 9 metres breathing 100% O ₂ No repetitive dives
SCUBA diving regime:	In accordance with AS 2299 requirements Dive tables - USN Working depths - 28-42 metres. Max. bottom time - within no deco diving limits Precautionary deco stop - 5 minutes at 5 metres No repetitive dives.
All diving was carried out in accordance with the Queensland Museum's Code of Practice and the Manual of Diving Operations. Divers are required to hold a Commercial Diver Certificate of Competency, (AS 2815, Parts 1 & 2).	
Excavation equipment:	GAAM Mk 200 water pump powering a 150 mm diameter water dredge. Semi-submersible 3-phase electric pump.

APPENDIX 4

"Pandora - piecing together the puzzle", *The Sydney Morning Herald*, Official A Sea Change Program 1998.

Pandora - piecing together the puzzle

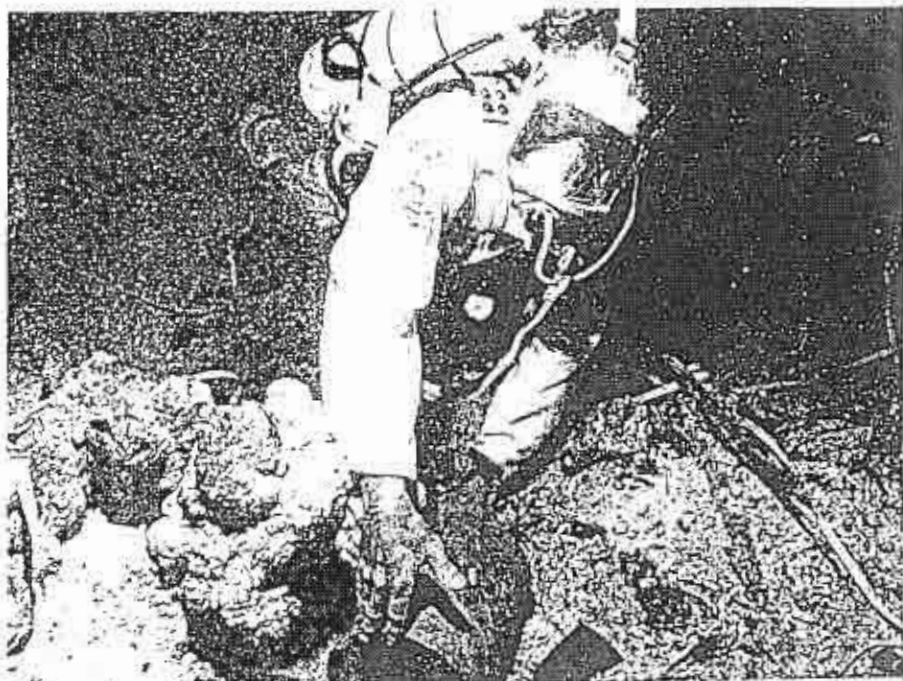
The story of a shipwreck lies deep in the depths of the ocean on the Great Barrier Reef comes a trip back in time.

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Townsville Museum of Tropical Queensland
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concessions available (07) 4721 1667



Left: The Pandora wreck site.



Right: The Pandora wreck site, showing the ship's hull.